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THE PUBLICATION FOR THE CP/M COMMUNITY

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VOLUME 3, NUMBER 1

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#### **EDITOR:**

Carol Buchanan

#### **MANAGING EDITOR:**

Pamela J. McKee

#### **EDITORIAL ASSISTANT:**

Errol Smith

#### **TECHNICAL EDITOR:**

Stuart Stern

#### **CONTRIBUTING EDITORS:**

George W. Fletcher

Robert Larson

Caddy McCall

Michael Prezbindowski

#### **CIRCULATION:**

Debbie Foster

#### **PRODUCTION:**

Cynthia Grant

Sherry Griffin

Tracey McKee

Florence O'Brien

Denise Wertzler

#### **CONTRIBUTING PHOTOGRAPHER:**

Jeffrey S. Griffin

#### **CONTRIBUTING ARTISTS:**

Arturo Artorez

Sherry Griffin

#### **DEALER SALES:**

Sharon Fudim

Jean O'Brien

#### **SPECIAL PROJECTS:**

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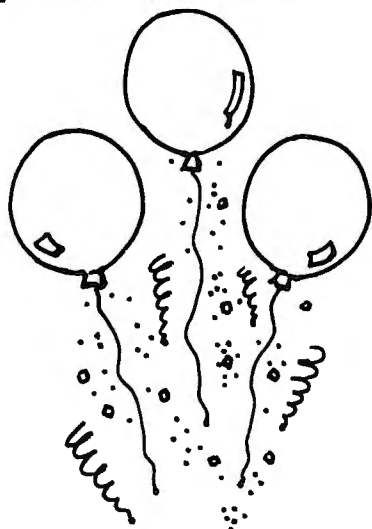
#### **PRINTING:**

Thomas Ogle



# From the Editor

by Carol Buchanan



Happy New Year!

The year 1984 means more than just another year. Those digits, since the publication of George Orwell's book, have merged into the American consciousness along with the warning, "Big Brother is watching you." As the year approached, commentators connected their fears of Big Brother with fear of the computer. They cited the enormous databases of information about each of us that reside in the Social Security system, the FBI, the credit industry, and the central bank of health information that your health and life insurance companies checked when you applied for your policies.

All of this exists, and the dangers are real. What the fearful don't seem to remember, however, is that Orwell patterned Big Brother after Hitler, Stalin and Mussolini, all of whom achieved their nefarious ends

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*Publishers Note: Carol Buchanan has joined CP/M REVIEW as Editor. Carol brings with her fifteen years' experience in technical editing of books and periodicals on subjects ranging from political and social sciences to law and electronics. With a Ph.D in English, and her experience in investigative reporting, as well as a great interest in computing, we are proud to have Carol heading up our editorial staff.*

before the computer was anything more than vacuum tubes and wires.

The danger to privacy exists not in the computer, but in people who misuse it. It's a human problem, not a computer problem. Orwell's 1984 is not a product of the computer age, but of the desire to dominate others.

The computer, we think, especially the microcomputer, which made computing accessible to the home, is the greatest stimulus to human creativity since the invention of pen and ink. All over the country, people in basements and converted bedrooms are writing -- programs, articles, poems, journals, books. On their computers. Their children are learning more and better with a wide variety of educational software. There is a renaissance of creative effort going on in this country--on the computer.

Throughout 1984, we at CP/M Review will bring you information on this renaissance and help you take greater advantage of your own computer. To do so, we are shifting the emphasis from our previously business-oriented approach. We intend to cover more of what's happening at home in software development, education, and the public domain.

This issue begins our year-long series on telecommunication, one of the ways in which the cottage industry developed in the home communicates with the outside world. In March we'll bring you information on how the computer is aiding learning--in school, at home, and on the college level. May will cover such legal issues as copyrights and protection. July will feature the public domain and showcase some excellent software, for a variety of uses, that our readers can obtain free. Our September issue will explore independent software development. We'll show you who, on their own, are developing software, for what purposes, and for whom. Most of these programs retail for under \$50,

and they are quite impressive. November will close out the year with a survey of printers and spoolers to go with home computers.

We invite your participation. Write us letters. If you have software you're developing, let us know about it. If you want to know what is in the public domain and how to get it, we'll help you find it.

Send us articles and ideas for articles. Just enclose a self-addressed, stamped envelope, and we'll tell you if your idea is for us. We'll send you our writers' guidelines, too, if you send SASE.

In addition to our regular software and hardware reviews, we're adding book reviews, so if you'd like to review a book for us, let us know at the editorial address listed on table of contents page.

We believe in the upsurge of creative effort we've been telling you about. Join us as readers or contributors, and we'll make the computer age the age that defeated Big Brother!

## COMDEX AT LAS VEGAS

Review Publications went to the COMDEX show in force with a booth at the Riviera and seven of us to cover the show. We also had a professional magician running a small show from our booth every hour. The Amazing Beckmann kept everyone's attention. A total of more than 83,000 people made their way to Las Vegas this year to see what's new in office automation. The task was not easy with over 1400 displays in the enormous new Convention Center and overflow in the Hilton, Sahara and Riviera Casinos. For CP/M interests there were not many new software products, however there were lots of new and interesting hardware announcements - see this issue's COMDEX section. All of the action was not in the main hall, however, we distributed 12,000 magazines to visitors at our booth.





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# **dBASE II USER'S FORUM**

## **ASHTON-TATE RUNTIME CONFERENCE**

by **George Fletcher**

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*George Fletcher, C.P.A., resides in Seattle, Washington, where he is a consultant and free-lance writer specializing in business management systems, database design, and software development.*

The 350 programmers, entrepreneurs, vendors and reporters who attended Ashton-Tate's Runtime Conference last November in Long Beach, California, all had one thing in common—an interest in producing and selling special-application software written in dBASE II, and particularly in marketing it. Many had a dBASE II application program ready or nearly ready for marketing, a few had already begun to sell software, and some were there to find out more about the business.



*Dr. Edward Feigenbaum of Stanford University was the after lunch speaker for the dBASE II RUNTIME CONFERENCE.*

The conference provided valuable insight into the process of publishing and selling software, some technical advice, and a chance to meet other dBASE II program developers. For many, the opportunity to get a closer look inside Ashton-Tate itself, one of the most successful marketing organizations in the business, was the highlight of the conference.

The number of dBASE II users has grown dramatically during the last year, capturing a significant share of the total microcomputer software market. Ashton-Tate is no doubt still evolving, as it learns to deal with big business problems, and dBASE II is still under development, as competition and better machines create a need for a more powerful product. Runtime application developers will play a key role in Ashton-Tate's future marketing strategy, since they are helping to make dBASE II a standard application development language and database manager.

The dBASE II entrepreneur is a new type of computer person. dBASE II has been used for custom programming from the very beginning. However, by September of this year, the number of licenses had reached about 130,000 while, at the same time, microcomputers moved from the basement and back rooms to the living rooms and front offices. Thus with dBASE II firmly established in a vast, expanding market, hundreds of accomplished dBASE





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II programmers have been quietly preparing to take advantage of the increasing demand for special-application software. There are over 700 active Runtime developers, and, I believe, hundreds more who have projects in development.

Their typically non-technical background makes most Runtime developers different from their BASIC and FORTRAN predecessors. dBASE II is indeed harder to master than many users had expected, but most would agree that they would not have attempted similar applications in a classical computer language. Few of the people at the Runtime Conference appeared to have any kind of prior technical or computer experience—including some of the speakers who had successfully marketed a dBASE II application or were at least well into the project.

The principals of most Runtime development ventures are individuals who had originally used dBASE II to solve some specific problems in their business or profession. Being active in the business world, it is not unusual for such people to see the potential for packaging and selling the resulting system to their competitors and colleagues. For the

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## *valuable insight into the process of publishing and selling software*

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first time, these individuals are able to conceive of and develop a specialized application package with little or no outside technical assistance. While technical expertise certainly becomes important at some point in the development process, it seems to be less of an obstacle than it used to be.

Vertical marketing of internally developed software is nothing new. However, with more powerful

micros taking their place as standard equipment in almost every type of organization imaginable, the economics are changing significantly. Vertical marketing of software for larger computers has generally been a business characterized by high margins and low to moderate volumes, and has required large investments and considerable technical expertise, both before and after development. The dynamics of the microcomputer software business center on lower margins and, to be successful, very large volumes. Perhaps more significantly, the cost of entry is much lower in all respects—less expensive equipment, less technical knowledge required, shorter development time, and quite often, less expensive access to the market. This does not, however, add up to instant success for anyone with a good idea. In any profitable industry, when barriers to entry are diminished, the result is a flood of hopeful participants with good ideas, some extra time, and limited funds. Ashton-Tate, in their Runtime program, has recognized the potential in addressing the requirements of this new “cottage industry.”

While the cost of starting a software development project may be relatively affordable for many individuals, the cost of completing the product and establishing a position in the market can be more than the developers have available, and often more than the potential of the product. Anyone who came to the conference with little understanding of the software marketing business may have gained enough knowledge to either avoid an ill-conceived venture or, hopefully, to move ahead with a more realistic plan. Indeed, many had completely revised their approach to marketing their software by the time they left.

To set the tone for the conference, David Cole, the president of Ashton-Tate and an accomplished business strategist, delivered a no-nonsense, fast-paced orientation to the microcomputer software market. Cole sees the specialized, “vertical market” applications as being the fastest-growing segment of the microcomputer software industry, in

terms of market share. This, of course, is the whole idea behind the Runtime program. With an impressive array of charts and graphs to show where the opportunities appear to be strongest, Cole left little doubt in the minds of his audience as to the importance of strategic market positioning.

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## *there are over 700 active RUNTIME developers*

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The conference was a mixture of short presentations followed by questions and answers from the audience, and workshops which covered all phases of applications development, including the actual design and coding of the programs, documentation, organizing the business end of the venture, publishing, marketing, distribution, and copyright protection. Each of the speakers had a different story to tell, and a different point of view as to how to manage a software project. Being actively and quite successfully involved in the software business, they constituted a most credible source of information. One message dominated in most of the discussions: Marketing a product and running the resulting business is much harder than the actual development process. Most importantly, this message was backed up with a wealth of insight and practical details about the business that would be difficult, if not impossible, to obtain elsewhere.

While marketing was the dominant theme of the conference, technical matters were covered in surprising depth for those who were interested. One of the highlights of the conference was the “New Features Forum.” Perry Lawrence revealed some of the plans already in motion for a 16-bit version written entirely in the “C” language, targeted at the UNIX operating system in addition to MSDOS and

CP/M 86. With expanded capabilities, such as the ability to have four open database files, 15.9 digits accuracy, room for 256 memory variables occupying up to 6000 bytes, and more powerful relational database commands, the new version will open the way for migrating dBASE II applications and programming expertise up to the more powerful 16- and 32-bit microcomputers. The new version will require 128K of free and clear memory (that is, in addition to that taken up by the operating system), and will be about "80 percent" upward compatible from the current versions. No indication was given as to when this may become available.

While some of those attending the workshop expressed concern over the compatibility problem, many others were pleased to learn that their investment in dBASE II programming skill and applications will lead to more than an 8-bit emulation on the more powerful microcomputers. With this development strategy, it is unlikely that Ashton-Tate's dominating market share will be eroded for lack of response to the expanding capabilities of microcomputers. This, of course, is good for established dBASE II programmers as well as for Ashton-Tate, since the popularity of dBASE II is a major factor in the successful marketing of RUNTIME applications.


Lawrence, and later Wayne Ratliff in his workshop, emphasized that the current versions will continue to be supported in the future regardless of the direction taken by 16-bit versions, 8-bit users may look forward to another enhancement with, among other things, a "tertiary" database area, in addition to the existing "select primary" and "select secondary" capabilities. This third open database will, I believe, satisfy most of the need for multiple file operations.

Someone said that "To know Wayne Ratliff is to know dBASE II," (and vice versa, I suppose). Thus, for me, another highlight of the conference was the technical workshop held by Wayne Ratliff, who wrote dBASE II, and Jeb Long, who wrote the original mainframe

program which was the model for the microcomputer version. Ashton-Tate has established a research and development center where both Ratliff and Long are working full-time on enhancements to dBASE II. Those who were using dBASE II in a very technical way found the question and answer session most interesting. The sessions centered around the internal workings of dBASE II, including the buffering mechanism, the "structure of the structure," the indexing structure, and other matters about which Ashton-Tate has been, until now, understandably quiet.

Although the conference focused on marketing, the subject of programming technique was not overlooked. Tom Rettig's workshop on "Programming Craftmanship" and the 101 page handout that went with it, was, for some, the best part of the program. Through his experience as technical editor of dNEWS and as a support technician, Rettig has come to know dBASE II about as well as anyone. The booklet of technical notes, optimization suggestions, work-arounds, powerful algorithms and

valuable utility programs is invaluable to anyone who uses dBASE II professionally. Those of you who missed the conference will be pleased to learn that this material was taken from a forthcoming book, the *Advanced Programmer's Guide*, by Luis Castro and Tom Rettig. They expect it to be released in late spring, 1984.

Judging from the enthusiastic response, it is likely that there will be more like conferences in the future. Anyone who is even considering the development of a dBASE II application for general distribution should try to attend the next one. The information and contacts to be gained can make all the difference in a project. But don't expect to hear about how easy it is to get rich selling dBASE II Runtime applications. You might, in fact, come away convinced that you haven't the necessary resources to complete the marketing effort, or that your idea wasn't really very realistic. On the other hand, you might obtain enough insight into the business to give your program a reasonable chance for success in an increasingly competitive business. 



David C. Cole, President and CEO presenting the keynote speech in the Grand Salon aboard the Queen Mary. Cole shared research figures with the group of dBase II software developers.



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# GOOD THINGS IN SMALL PACKAGES

## Personal Micro Computer's MicroMate

by Stu Stern, Technical Editor

The Personal Micro Computer's MicroMate is a satisfying and complete 8-bit microcomputer system in a very small package. It is a Z80-based microcomputer with all the bells and whistles needed for practically any 8-bit environment.

I was originally introduced to the MicroMate prototype in San Francisco at the CP/M '83 West show, in January of 1983. Being favorably impressed with its size and capabilities, I ordered one. Approximately four months later, I received the PMC MicroMate; it has proved to be all that was promised.

In my situation MicroMate is a perfect match, since my work already demands a computer terminal

to communicate with several time-sharing services.

### PHYSICAL CONFIGURATION

My MicroMate measures 3-1/2" wide X 6" high X 15" deep and weighs approximately ten pounds. This model is a few inches longer than the standard 5-1/4" floppy drive cabinet, but I understand that the current model has been cut by 2-1/2 to 3 inches.

### TECHNICAL SPECIFICATIONS

The MicroMate is a 4 MHz Z80A, 128KB bank switched microcomputer with a 400KB 5-1/4" half high floppy disk, all packaged in the enclosure the size of a single full sized 5-1/4" floppy disk drive. The MicroMate does not have a built-in video display driver, but requires a conventional ASCII RS232 terminal for a console. For people already using standard computer terminals, the MicroMate is a natural. Because of its low cost, the additional expense of an inexpensive terminal still keeps the MicroMate within favorable cost. Additionally, the ASCII terminal can provide a convenience in supporting other computer-related activities.

The system, which is a single-board computer, contains a 4KB EPROM of which only 80 or so bytes are used for a disk boot. The MicroMate supports two serial RS232 asynchronous ports at speeds of 50 to 19,200 baud. One port is designated for the system console,





and the other port is typically used as the modem port. In addition, a Centronics parallel port is included. When the occasion requires the need for a serial printer port, the modem port doubles for that as well.

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***All of the  
PMC software is  
well thought out  
and bug free***

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The system contains a Zilog CTC chip to provide the Real Time Clock. The clocks within the CTC chip are accessible to the system for time-of-day as well as serving as a programmable interval timer.

The 5-1/4" Panasonic direct drive floppy disk included with the system is particularly nice with a 400KB unformatted storage capacity. The system will support up to four drives.

Generally with a system of this type, I consider expansion possibilities rather limited; however, PMC's MicroMate does have an expansion interface. Although not brought out to the back panel, the interface connector is still accessible if required. The expansion interface appears to be a generalized I/O bus:

Signal Name	Pin #
Data	0 1
Addr	0 2
Data	1 3
Addr	1 4
Data	3 5
Addr	6 6
Data	2 7
Addr	2 8
Data	4 9
Ground	10
Data	6 11
Addr	4 12
Data	5 13
Addr	3 14
Data	7 15
Addr	5 16
IN 17	RESET 18
Out 19	+12vdc 20
CTC	trgl 21

PMC says this interface will support future expansion offerings such as hard disk drives, eight-inch floppy disk drives, voice and music synthesizers, and networks. Indeed, this is happening. Currently, PMC does support a Winchester drive. I assume volume and demand will determine the development of additional hardware.

#### **OPTIONS**

Complementing the basic unit, Personal Micro Computer offers additional 5-1/4" floppy disk drives in single or dual configuration. For those of you with large database application requirements, a Winchester hard disk drive is also available.

If you do not already have an ASCII RS232 terminal, PMC will couple the MicroMate with the QUME (Model QVT-102) at additional cost.

#### **MICROMATE'S SOFTWARE COMPLEMENT**

My MicroMate was supplied with three disks of software:

1. The CP/M Plus System Master
2. The CP/M Plus Source Master
3. The T/Maker III Master.

The CP/M Plus System Master disk contains CP/M 3.0, day-to-day CP/M programs, and miscellaneous PMC utilities.

The CP/M Plus Source Master disk contains the MicroMate's BIOS source listings as well as the EPROMed boot and the track zero CP/M loader listings. In addition, all of the CP/M modules necessary to modify the system reside here.

The T/Maker III Master disk contains all of the modules that comprise the T/Maker III word processing package. This set of integrated modules represents several capabilities:



1. Word processing
2. Electronic Spreadsheet
3. List Processing
4. Graphics
5. Data Transfer
6. Files Management

As a word processor, T/Maker III is quite complete and satisfying to use. One particular feature that I enjoy and have not seen on many of the current word processors is the "align" command.

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***One the of nicest  
features of the  
MicroMate is its  
software utility  
package.***

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By defining text margin indicators, the document's text may be formatted as "block text" (all lines are individually centered), and "Indented or Numbered Paragraphs." The interesting point here is that the formatting is done on your terminal screen for your ease and convenience, rather than having to wait until the document is printed. In addition, this capability does not embed special word processing commands or special characters within the text itself; however, many print formatting facilities are also provided.

All of the capabilities are primarily oriented to the word processing environment and do not necessarily reflect the full and complete facilities of some of the popular programs (especially in the Electronic Spreadsheet and graphics areas). Although these capabilities are extensive and greatly enhance the word processing, do not be misled. The PMC MicroMate does not come with the generally known variety of spreadsheet or graphics facilities.

With all of the software being bundled with many microcomputer

sales, I did feel the lack of a spelling package to accompany T/Maker and some form of higher level programming language to make the package complete. (CP/M 3.0 comes with an assembler.) It is my understanding that PMC is now including Electric Webster and CBASIC with the purchase of the MicroMate.

#### **SOFTWARE UTILITIES INCLUDED**

One of the nicest features of the MicroMate is its software utility package. The utilities accompanying those supplied by CP/M 3.0 provide for a complete set of capabilities. The utilities include:

1. FORMAT provides the ability to format the 5-1/4" floppy disks in the unique PMC format. In addition, the FORMAT program provides an integral or separate disk verification capability. The visual feedback during execution is ample.

2. BACKUP, as the name implies, provides the ability to duplicate floppies (track for track). This particular implementation is fast, since all of the MicroMate's banked memory is used. Two advantages will be recognized by those individuals with a one-disk configuration. First, the backup utility does provide for a one-disk duplication. Second, the duplication only requires the user to switch disks four times. Again, visual feedback and error detection are ample.

3. CONFIG provides the user with the ability to dynamically configure the system. Configuration includes terminal and modem baud rate selection (from 50 to 19,200), word length, stop bits, parity, DTR and RTS selection. The number of disk drives supported is also configured here. The ability to reconfigure the modem port dynamically has proved invaluable, although I find the requirement to cold boot to install the modifications a bit awkward at times.

4. CONVERT is essential and probably the most exciting utility in the package. This utility provides the ability to assign one of your floppy drives the personality of one of 18 or 19 different manufacturer formats listed on the accompanying

menu. The assigned disk drive maintains the selected personality until a cold boot is issued. Although a single drive configuration can be assigned, this utility proves to be more effective with at least a two-drive system. Since the PMC MicroMate uses a unique disk format under normal operation, this program is essential when purchasing commercial software in a format that is compatible with your system.

The menu of selected disk formats indicates empty slots for possible future expansion. This is not true. The source code for this program is not available and no maintenance provision exists to add formats. When questioned about this, Personal Micro Computer said they would "on an individual basis" provide specific formats required.

5. SYSTEM is a complete and self-contained hardware diagnostic, but unfortunately does require printer support for complete use. This program tests the major components of the system. The DART communications chip testing is done by connecting the console port directly to the modem port and receiving diagnostics via the attached printer.

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***provided with three  
bootable disks at  
different console  
baud rates***

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With my system, I found a definite need for a one-disk single file or multiple file copy utility, but was not supplied one. It is my understanding that PMC is now supplying this utility. All of the PMC software is well thought out and bug free. The only inconvenience I experienced was very minor. A full screen of documentation precedes each utility on initiation.



Utility documentation is necessary; however, the experienced user will find it gets in the way. A "help" key would let the user call up online documentation if he/she needed it.

## DOCUMENTATION

The documentation for the bundled software supplied with the MicroMate is superb. The reason is that Personal Micro Computer includes the official documentation from each software manufacturer. I don't know how many times I have seen hardware manufacturers attempt to write their own highly abbreviated version of documentation for bundled software, especially CP/M. Adding insult to injury, the documentation in those circumstances is not professional and looks like the twenty-seventh copy of a dot matrix printout. It was a pleasure to receive complete sets of documentation by Digital Research and T/Maker.

The DRI documentation of CP/M 3.0 is quite extensive and has proven to be comprehensive, but the CP/M Plus "User's Guide" page numbers do not agree with the index. They seem to be offset by a couple of pages.

T/Maker's documentation consists of a large "Reference Manual" and "Quick Reference Booklet." The layout and presentation of this documentation make it easy to use.

Its appendix contains the installation procedures. The Quick Reference Booklet is useful from several viewpoints. The booklet is made completely (pages and all) from heavy stock paper, with each subsystem clearly tabbed. Extensive use of illustration and color enhance the booklet, and all commands and options are summarized and presented in quick reference style.

The PMC documentation is printed and bound, having several informative pictures of the MicroMate and illustrations. It is easy to understand and its technical orientation will support most users. The Table of Contents include:

1. INTRODUCTION
  2. INSTALLATION
  3. INSTALLING OPTIONAL EQUIPMENT
  4. SOFTWARE UTILITIES
  5. DEVIATIONS FROM STANDARD CP/M PLUS
  6. TECHNICAL REFERENCE
- APPENDIX A.  
Cables and Connectors
- APPENDIX B.  
Error Messages
- APPENDIX C.  
Problems and their Probable Causes
- APPENDIX D.  
Suggested Reading

Of particular interest was the Technical section. It adequately covered PMC's implementation of

CP/M 3.0's Bank Switching, PMC diskette layout and format and Boot sequence. The PMC documentation did lack port addresses; however, all of the PMC BIOS and associated source code is available on the CP/M Plus Source Master floppy disk. The documentation coupled with the source listings proved to be more than acceptable. Digging through listings is a bit primitive when trying to find research information needed for software installation requiring port addresses; however, many microcomputer manufacturers don't include the source for the BIOS, etc. This lack of documentation renders system modification impractical.

The documentation also does not include the MicroMate's electrical schematics, but a maintenance manual (with schematics) is available from Personal Micro Computer, under separate cover.

## INSTALLATION

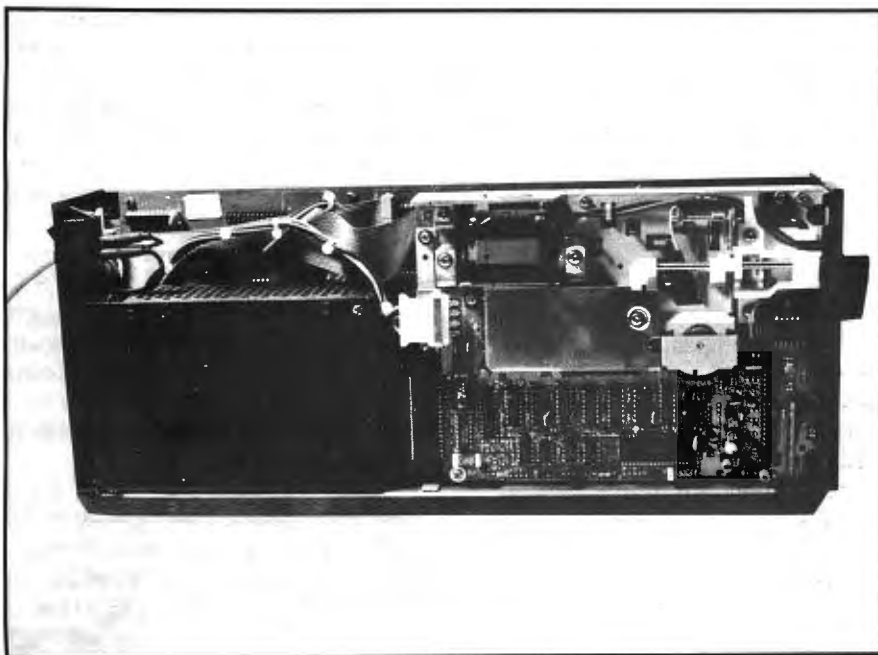
As mentioned earlier, the PMC software resides on three disks. To provide for easy installation, each disk is configured with a bootable version of CP/M Plus supporting different console baud rates. As a result, if you are working with a fixed speed console device, it is probable that your needs are satisfied.

The floppy disk and printer ports are in the form of pc edge connections. One potential problem is that the edge connections are not keyed, which tends to invite improper connection orientation. With this warning in mind, reasonable documentation, labeled peripheral ports, and three different bootable disks, hardware installation is easy.

T/Maker installation, on the other hand, is more intensive. A large section of the T/Maker Reference Manual is devoted to it. With that as a guide and the support programs supplied, installation is reasonable. I did, however, have some difficulty in understanding some of the printer installation procedures.

## PERSONAL OBSERVATIONS

My time spent using the PMC MicroMate has been a pleasurable one. Several aspects made that so:





1. It was convenient to be provided with three bootable disks at different console baud rates.

2. The MicroMate's EPROM does not contain the traditional BIOS (hardware driver routines), but

contains a boot loader. The boot process is "phantom." The boot is in the 4KB EPROM (occupying approximately 80 bytes). The complete CP/M system including the drivers is loaded into RAM memory from disk. This provides the system hacker with the ability to simply add or modify (or both) the system drivers without the inconvenience of having to erase and "burn" another EPROM.

Or, if desired, you may completely remove CP/M and its requirements in lieu of another unrelated system. The almost empty EPROM gives me sufficient space to insert a self-contained monitor (independent of disk routines). Past experience has shown that a system totally dependent on secondary storage for any form of execution can cause difficulties. I have worked on systems that were difficult to diagnose, as I could not run and exercise anything. With a resident (EPROMed) monitor, the user still has minimal control of the system.

3. CP/M 3.0 has proven to be quite solid.

4. All utilities are well thought out, and the CONVERT utility is a major asset to the system.

5. It is satisfying to be able to have software selectable communication options for console and modem ports.

6. The T/Maker word processor is more than adequate, especially with

the new distribution of Electric Webster.

7. I particularly like the 128KB bank switched memory. It is available to those programs that are written to use it, but I may also use it (via public domain software) as a RAM disk.

8. My whole system is relatively portable, although I find the relocation of any system a pain, because it means reconnecting peripherals. In this case, each user will find portability directly proportional to the size of his terminal. If you are fortunate enough to have a terminal at work and at home, there is no question of portability. Simply put MicroMate in your attache case and go anywhere.

## PMC does support a Winchester drive

All in all, I find this microcomputer a great 8-bit development machine. In addition, with all the available documentation and source code, the PMC MicroMate is totally under my control. If I purchase a microcomputer, I should have the total information and capability to reconfigure software or hardware to my pleasure or DISMAY.

### SYNOPSIS

In the six months of use, I can honestly say that I have not been a bit disappointed with any aspect of the MicroMate. Since my terminal is small, the complete system footprint is insignificant on my desk, and I find the MicroMate a favorable 8-bit development system.

The MicroMate would fit nicely in almost any single user 8-bit environment. Because of its size, ASCII terminal dependence and low cost (list \$995), the MicroMate could also have great potential as a work station in an inexpensive networking system.

Additional information about the PMC MicroMate, Model PMC-101, can be obtained from Personal Micro Computers, Inc., 475 Ellis St., Mountain View, CA 94043 (415) 962-0224.



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# CONVERSATION with a PIONEER

by Mike Prezbindowski

William Godbout is the founder and Chief Executive Officer of the CompuPro Corporation. CompuPro is one of the oldest computer companies in our uncertain industry, and Bill relates to us some of his background and business philosophy that has enabled them to survive, in fact flourish since 1973. CompuPro evolved from some Godbout companies that manufactured kits and S-100 components to a corporation that offers an impressive line of complete computer systems. They haven't abandoned S100 or board products, in fact they are offering STD Bus products and are considering new bus products. A large segment of their market is



*After a FORTRAN class at the UofW unearthed a hidden interest in computers, Mike Prezbindowski opened the first BYTE SHOP in Seattle. He has since taken on long term contract programming tasks, Electronic Technician tasks at The Boeing Company, and is presently employed with the Wilbur Ellis Company as Computing Operations Manager.*

industrial based and they have large OEM accounts in the United States and Europe. You may be using some CompuPro products and not know it. While not an overnight giant, they have been continually building a strong base of support and have consistently offered products known for their reliability. Mr. Godbout has been a force in the development of the microcomputer industry.

**CP/M REVIEW:** *Bill why did you start your own company?*

**Godbout:** I had to have a job! Something to keep me off the streets and out of jails. Actually, I have been involved with computers in one way or another since college.

**CP/M REVIEW:** *What did you do after college?*

**Godbout:** I was recruited by IBM while in undergraduate school at MIT. At IBM I participated in the development of such machines as the 704's, 705's and 709's and worked on the team that did the "90" and the "STRETCH" machine. (The "STRETCH" was so named because it stretched the capability and technology of their company.) I was then recalled to active duty with the Army during the Berlin crisis.

**CP/M REVIEW:** *Since you're from the East Coast, why did you start your company in the Bay Area?*

**Godbout:** I had been to San Francisco several times and it looked like a nice place to spend a couple of years. Also, the opportunity arose to take over a foundering company as a crisis manager for a period of 24

months. I started as manager of systems development and left 13 months later as general manager.

**CP/M REVIEW:** *Then you have had business training also?*

**Godbout:** I don't want to say I'm just an engineer, I'm not just a "technocrat." While at IBM I had extensive management training. When you go to work for IBM, your management training starts the day before you go to work for them, when you are selected for employment and accept their offer. You get, directly and indirectly, a good orientation. IBM is a very well-managed company. If I were to work for someone else, my first choice would be IBM.

**CP/M REVIEW:** *IBM seems to be a very conservative company. Only in the past 2 years have they increased their presence with the marketing of the Personal Computer. In the small computer market CompuPro seems to be a bit more conservative than other companies. Is this because of your IBM background?*

**Godbout:** IBM is not as conservative as you think, they have gone out on a limb many times while pursuing various market segments. The "STRETCH" machine, like many of the products they brought out, was great for its day and even today would be no slouch. Many of the things we take for granted were way out in the ozone back then; interrupts, memory management, multi-programming, dual CPU's, all



came from that project. The IBM 7030 (a 72-bit 200 nanosecond machine) for its day, was a marvel; it was a bigger leap forward for technology than a "STRETCH" to a CRAY-1 is today. It was the first of IBM's second generation computers. They started the project in 1955. It was re-designed in '58 and got out the door in late 1960. I think they built six of them. Everything was being done with dual triode tubes and IBM had to design and manufacture its own transistors in order to build this machine, there was semiconductor core memory with interleaved memory cycles because the cycle time was only 2.2 microseconds. But they brought it down to 2.0 and finally 1.8 microseconds. The same memory boxes were used later on the 7090. All of the packaging concepts for the 7000 series came out of the "STRETCH" project.

Then RCA announced they had 5 billion dollars to commit to the computer business from the monstrous sale of TV sets in the mid to late fifties. RCA had this big cash bubble and the computer business looked like the way to go. At the time RCA announced its intent to throw this amount of money into computing, IBM had not even had a billion dollar year. That takes guts and entrepreneurial spirit. It takes real management to pull off something like that. I admire IBM and think highly of them as an employer, an entity, and as a competitor. Because at some point we are going to come head to head, I hope. **CP/M REVIEW:** *Do you think there is room in the marketplace for all the now existing computer companies?*

**Godbout:** Obviously, IBM and the others are not all things for all people. There is a nice hole where IBM has been spectacularly unsuccessful. IBM's share of the low end minicomputer market is only 4 percent compared to 80 percent on mainframes.

**CP/M REVIEW:** *Does the*

*background and experience of CompuPro give you any advantages in this area of the market?*

**Godbout:** While other manufacturers such as WANG, IBM and DEC have entered by the back door into the micro fray simply by putting CP/M onto existing machines previously dedicated to word processing, we at CompuPro have historically only offered CP/M on our equipment. This gives us a definite advantage.

**CP/M REVIEW:** *CompuPro's recent emphasis on the business market will require a good service network. Has the ground work been completed in this area?*

**Godbout:** We have an agreement with XEROX called AMERICARE, for CompuPro system level products. This opens up the market for our S-100 and non-S-100 systems, and offers new potential in the business and scientific markets.

**CP/M REVIEW:** *How is XEROX gearing up for this task?*

**Godbout:** XEROX has been sending their people to us for technical

training on repair of CompuPro machines. We have also trained their instructors. They have assigned 300 to 400 technicians to our account which means that there will be 3 to 4 trained technicians at each XEROX service center. We do not want them to go to a customer's site and wave soldering irons around. Each location will have several different sets of spares and will only do modular replacement to minimize down time, not component replacement. With the introduction of the CompuPro 10 aimed squarely at the business market, it becomes essential that we bundle a service package with that system. This feature has been added without increasing the overall system price on both our S-100 models and Model 10.

**CP/M REVIEW:** *Do you plan to stay with Digital Research in the near future, with the popularity of UNIX becoming so widespread?*

**Godbout:** We have been asked numerous times why we don't support UNIX on the 68000. We have looked at it and have not found any implementation that we liked; we do not feel that the 68000 has enough horsepower to handle a true multi-user UNIX configuration. Bell Labs currently has a CompuPro system prototype using the National 16032 CPU and is porting UNIX for us. We will be showing it at the 1984 NCC. **CP/M REVIEW:** *Will the addition of UNIX affect your relationship with Digital Research?*

**Godbout:** DRI has got their act together and has become a real force in the marketplace. Creative Strategies, a marketing research company has predicted that by 1987, 49% of the market will be using UNIX and 37% Concurrent CP/M. I think we will still have an excellent relationship with DRI.

**CP/M REVIEW:** *How has CompuPro been doing as a company in the marketplace?*

**Godbout:** The market share of CompuPro today is 1.3% of the total according



*William Godbout, founder and CEO of the CompuPro Corporation.*

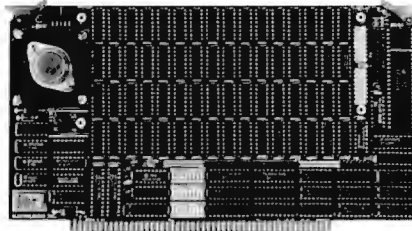
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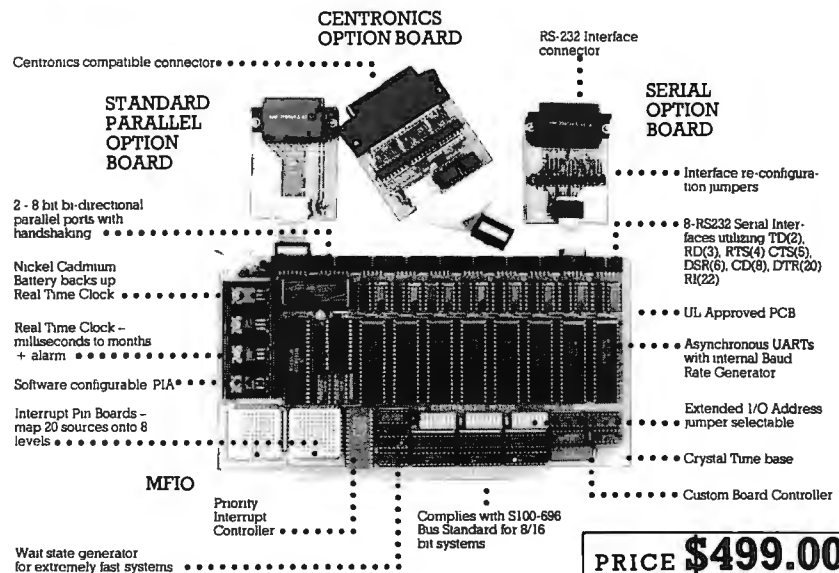
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to a survey completed by Data Solutions. This tallies closely with other market surveys. This figure puts us ahead of such companies as Alpha Micro, Fortune and Franklin. Where we really show up well is in surveys that show "brands under consideration." There we show a 4% share. These are surveys using open ended questions and not mentioning the Model 10 which hadn't been announced at the time, only CP/M S-100 systems. This puts CompuPro in direct comparison with DEC and other major manufacturers of computers smaller than mainframes.

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**a market research  
firm has predicted  
that by 1987 49% of  
the market will be  
UNIX and 37%  
Concurrent CP/M**

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We are pleasantly surprised at the statistical significance. We expect the model 68K, "10" and 16032 to cause quite a commotion. We do want to say for the record that the Japanese home market is safe at this time; we have no immediate plans to sell in Japan.

**CP/M REVIEW:** *How are your products being marketed in the United States?*

**Godbout:** We have a strong dealer network with close support. A strong dealer network is essential if you are to move from "Smalltown, Iowa," to "Backwoods, Maine." You must be in striking range of a dealer that will provide service, sales and support—with a smile.

**CP/M REVIEW:** *I understand CompuPro had a role in establishing the IEEE 696 standard, could you tell us about that?*

**Godbout:** The Chairman has always been an employee of CompuPro or an affiliate. George Morrow was designing for us when it started.

I personally did not have the time to be directly involved. Mark Garetz was chairing when the standard was completed; in fact, he typeset the whole thing.

**CP/M REVIEW:** *Did CompuPro's involvement in the process directly benefit the company?*

**Godbout:** If you mean did we control the steering of the committee, NO! The committee was put together to hammer out a consensus. The result is definitely not a CompuPro standard. I got a few things I wanted as did every manufacturer that reviewed the specs. But no, I was all for making the bus active low so when you let go of the bus nothing would happen. The DMA transfers, Ithaca Audio did that, Marinchip did the 16-bit memory and peripheral swap idea. Howard Fullmer from Parasitic Engineering had a lot of good input.

A funny sidelight to that. Before the S-100 subcommittee was formed a physician named Bill Shander and an instructor from Diablo Valley College decided in 1976 to have a meeting of manufacturers and end users. IMSAI, Altair and Processor Technology, to name a few, didn't bother to send representatives. All the attendees are still in business today. The non-attendees were either too busy or couldn't be bothered.

**CP/M REVIEW:** *What are the most significant markets for CompuPro?*

**Godbout:** S-100 products continue to be a major sales item for us. Mullen Electronics has become a partially-owned affiliate of CompuPro and is handling much of our STD bus market. Mullen is mainly involved in the industrial marketplace. They came under our wing after an unsuccessful venture into the Radio Shack market.

**CP/M REVIEW:** *Is the STD Bus product line a new venture for CompuPro?*

**Godbout:** We have been supplying memory boards and CPUs for the STD bus since day one. Rick Kalish, a member of the IEEE committee working on standardization, works for us. We will continue to support this market and Vector Electronics will be involved with us. We do not plan to drop out of the industrial

market—we plan to get bigger.

**CP/M REVIEW:** *You mentioned Vector Electronics' involvement in this venture. What is the relationship between Vector and CompuPro?*

**Godbout:** We have just completed an agreement with Vector Electronics to provide second sourcing of CompuPro products. Vector is a well-established company with many years of experience in the manufacture and packaging of electronic products. They have a large industrial distribution network in place and serve pegboard customers as well as the Fortune 500 companies such as Bell Labs. Any firm using electronics is probably familiar with the Vector name.

The second source market is aimed at the third-tier products where the computer is actually a subsystem and the end product may have a design cycle of 18 to 20 years. This allows CompuPro to maintain its leading edge position with regard to technology while assuring manufacturers that products they design today will be available tomorrow. As CompuPro products are phased out of production, Vector will pick them up if the market warrants. British Telecom is one example; they use our products in their stock quote system which was years in development. They just ordered 1000 boards with more to come. The same distributor in the U.K. will serve as second source for Vector at the time we switch manufacturers.

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**we are definitely a  
growth company -  
not hit and run**

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**CP/M REVIEW:** *Is Vector capable of maintaining the level of quality you build into your products?*

**Godbout:** Vector is a fully integrated manufacturer, from laminates through punch, plate, drilling and soldering. The Vector S-100 motherboard is a Godbout design



built under license by Vector. We have the utmost confidence that the level of quality inherent in CompuPro products will be maintained by Vector.

**CP/M REVIEW:** *How long have CompuPro and Vector enjoyed this working relationship?*

**Godbout:** Vector has had a good working relationship with Godbout for years. There is a high level of technology transfer between the two companies. Their engineers are on a first-name basis with ours and communicate regularly. A channel for technology exchange exists and is used frequently, and is encouraged.

**CP/M REVIEW:** *Will the Vector computer line continue to grow in the future or will it be limited to a few products?*

**Godbout:** Vector and CompuPro will move ahead together, as CompuPro moves out of one product line Vector will pick it up as the market warrants. CompuPro is the first company to offer second sourcing in the micro business.

**CP/M REVIEW:** *What does the future hold for Bill Godbout and CompuPro?*

**Godbout:** Just over the horizon at the other end of the spectrum is the 32-bit machine. It poses a problem. Take, for example, the NS 16032, the CPU has a 16-bit bus and is double pipelined. Compare the Intel 8086 and 8088, one has a 16-bit bus and the other an 8-bit bus. The 8088 shows remarkably similar performance to the 8086 despite the smaller data path. This is due to its pipelined architecture. The 16032 benefits similarly and should not lose much when compared to a full 32-bit data bus.

We are currently working with Intel to clean up some things on the apx-386. It is a full 32-bit virtual machine that is upward compatible with its 8086-based predecessors except the 64K memory segment limitation has been removed.

**CP/M REVIEW:** *CompuPro has been mainly an S-100 company. How will you develop 32-bit machines for the S-100?*

**Godbout:** The S-100 concept works fine for 8- and 16-bit, but doesn't hold up to the 32-bit

processors. The obvious temptation is to multiplex some of the address lines to gain the needed extra data lines, but the reduction in bandwidth makes that an unacceptable technique. Probably, 32 bits is the point where we will have break with S-100 and move to a VME-like bus. There currently is no VME bus standard and we may get involved in that area.

During grad school at Cal Tech, Tony Pietsch published in the proceedings of the IEEE a proposal

called the PI bus. The VME is a takeoff of this. The thing that fires my rockets is that they didn't even acknowledge the source. It may be in their ignorance they didn't know where it came from, but the marked similarities are too great for the PI bus not to have been the lineal progenitor of VME. It sure would not have hurt anybody to acknowledge Pietsch's contribution which was put into the public domain.

**CP/M REVIEW:** *Most of the more sophisticated buses seem to drag the*

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Circle No. 23

JANUARY/FEBRUARY 1984

CP/M REVIEW

19

performance of their CPU's down with a lot of protocol. Will the PI bus also do this?

**Godbout:** The VME bus does restrict the computer's overall performance, but the PI bus, on the other hand, allows maximum performance.

**CP/M REVIEW:** *Your philosophy regarding mixing CPU's in an S-100 system is novel and useful. Will this also be carried to your 32-bit machines?*

**Godbout:** We will make available some sort of 8- 16- to 32-bit interface to allow slavery of these processors in future 32-bit machines, it may be through a converter from an S-100 to a future bus.

**CP/M REVIEW:** *CompuPro has not jumped into the networking market. Are you planning to, and with what type of protocol?*

**Godbout:** We plan to offer several types of networking options. There is currently chaos out there. We are looking seriously at Arcnet as it is a proven technique with an existing chip set. The CompuPro 10 has a SASI interface in the back and there are several SASI to "garbagenet" interfaces already are on the market. We will be making a product for the Model 10 that will be a hardware/software package. It will have two interesting ends. The obvious is the Model 10 end and the other will go to an IBM PC, S-100 or another

CompuPro 10. You can do any combination or permutation you want.

**CP/M REVIEW:** *The choice of Datapoint's Arcnet bucks the tide of support that the other manufacturers are giving Ethernet. Why do you think Arcnet is better?*

**Godbout:** It turns out that Arcnet provides better bandwidth and overall system performance than Ethernet. The reason for that is there is an awful lot of system overhead associated with Ethernet. Although Arcnet has half the stated bandwidth, it runs at least as fast or faster in a comparable context. Sure, you're shoveling data at 5 megabits instead of 10 megabits per second, but the overhead on each of the nodes is so significantly less for Arcnet that the overall throughput is of a networked system is much greater. With Ethernet, the data coming through the node slows down processing on the node while it figures out if any of the data should be received or not. I find this unacceptable. At this point, Arcnet is the front runner and we are looking at several others.

**CP/M REVIEW:** *Does CompuPro have a long range plan to help assure its continued growth and survival?*

**Godbout:** We are definitely a growth company, not a hit-and-run company. Ten years ago we started with Compukit and MusicKit. We do

not intend to rush into the public market with a take-the-money-and-run business plan. We would rather establish a long-term business. We are definitely in it for the long haul.

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***we do not plan to  
drop out of the  
industrial market -  
we plan to get  
bigger***

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We are not ruling out going public, we just aren't to the point where we have optimized profit and timing yet. Why grab a few 10's of millions when in five years we might knock off a couple of billion? We are fortunate that the company is solid and stable. We have had steady planned growth. I think it is obvious, if you look at our moves, that our products didn't just happen. Several business analysts have looked at our advertising and our products, and have noticed that over the past ten years the planned mix of products pulled together with phased growth.

**CP/M REVIEW:** *Is there any outside venture money in CompuPro?*

**Godbout:** We have no outside money, and therefore no pressure from venture capitalists who would require a money turnaround in five years. The Godbout Company is the venture company for CompuPro. The Godbout Company is involved in with many things--some not related to Electronics--mostly long term, such as an automated test equipment company and software companies. We do not intend to abandon the S-100; it's becoming more like the IBM stuff--well rung out and very solid. We find that there are a lot of companies just now considering designing micro-processors into their control systems. We who are on the cutting edge of technology sometimes don't

*Continued on Page 35*



# NEC APC

by Harry Avant

The NEC Advanced Personal Computer is made by Nippon Electric Corporation, the same company that produces Spinwriter printers. NEC's APC features authentic 16-bit computing, and a choice of operating systems. At this writing, Digital Research's CP/M-86, Microsoft's MS-DOS 2.0 and the UCSD P system operating systems are available. The NEC APC is for anyone who requires fast operation, first-rate graphics (monochrome and color), and sizable disk storage capacity.

## KEYBOARD CONFIGURATIONS

The APC is a two-piece unit consisting of a main housing and a detached keyboard which contains a total of 86 keys for general alphanumeric use, a numeric keyboard

and cursor movement keys. A total of 22 special-function, dual-mode keys located at the top of the keyboard provide for a total of 44 programmable special functions. With a total of 108 keys, the keyboard would appear bewildering, but its layout has been done well. A main cluster contains all of the standard typewriter keys, together with escape and control keys. Two supplementary keys are located at each side of the space bar, on the left of the Graph 1 and Graph 2 keys, and an Alternate and Help key are set on the right.

The Graph 1 and 2 keys display the special character set included in the APC. These are comprised of the Greek alphabet, mathematic symbols and a range of special characters such as arrows, block graphics, etc. The user may define a set of characters and display them with the Alt key. The Help key is coded to a 3F hex, the question mark character.

The numeric keypad cluster contains digit keys, enter key, arithmetic keys, cursor positioning keys, and some special use keys including insert, delete, clear, home, print and break/stop. The break key generates a control C code, and the stop key provides for a control S. The stop key is toggled so that alternate use of the key will either start or stop the scrolling function associated with a control S. Up and down arrows may be used in conjunction with the control key to scroll the screen for the previous 25 lines, which allows for a 50-line scrolled display.

Two types of character sets are possible, predefined and user-defined. The predefined set produces

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*Harry Avant works for Jet Propulsion Laboratory in Pasadena, California. He is a member of the technical staff involved in evaluating microcomputers.*





a total of 250 characters and symbols, using 8 X 13 pixels generated within an 8 X 19 matrix. User-defined characters using the same matrix may be generated, but the total number of characters is increased to 256 and uses an 8 X 16 pixel size. In either case, character resolution is excellent, with individual dots almost too fine to detect. Video control is handled by an NEC 7220 Graphics Display Controller (GDC). Each character may include an attribute feature, such as blink, reverse video, overline, underline and strike through. A sixth attribute feature is a color selection based on one of the eight available colors. Or, in lieu of color, a highlight is available.

The main housing contains a twelve-inch (diagonal) video unit capable of displaying 25 lines by 80 characters per line with an additional, non-scrolling, 26th line for status. In the non-graphics version of the APC, 12K of video memory are available. When the optional graphics subsystem is installed, a total of 640 X 475 pixels are accessible for graphics. With the graphics option, pixels are shown within a virtual display area of 1,024 X 1,024 pixels! Two types of cathode ray tubes (CRT) are offered—a monochrome green phosphor or a full color tube. In the color variant, the display maintains the 640 X 475 pixels and adds the capability of generating eight colors.

Although the non-graphics version of the NEC APC uses a NEC 7220 GDC, the power of this chip is not appreciated until the optional graphics package is installed. A second GDC, and 128K for monochrome or 384K for color, of additional graphics memory are included in this option. The GDC is an intelligent peripheral that functions between the video display memory and the data bus. This chip performs tasks such as generating faster display as well as management of display memory. A total of 256K of 16-bit words may be supervised by the GDC. Figure drawing of lines, arcs, circles, rectangles and assorted graphics characters are handled by the GDC. If desired, the GDC can partition the display into

four separate areas, each with 64K of display memory. A zoom function is also an integral feature of the GDC.

The NEC's color graphics are capable of being generated in eight colors: black, red, green, blue, yellow, magenta and cyan. NEC refers to magenta as purple and cyan as light blue. In addition to color, each character may take on a visual attribute with overline, underline, strike through, reverse, blink and color. In a non-color NEC, only black, green and a highlight (bright green) are available. NEC did not elect to provide a half-intensity video for the monochrome model. This could be missed, especially when running such applications as a powerful word processor. In the color model, overline, underline and strike through always appear in green. A true reverse color is available for color users. The lack of a half-intensity video may be overcome in the color model by

selecting a different color in lieu of true half-intensity video.

A 4.9 megahertz clock is used with the fully-compatible Intel 8086 Central Processing Unit (CPU). This CPU is capable of addressing up to one megabyte of memory, using a 20-bit address bus. Since the CPU is a true 16-bit device, 16 data lines are available. Input and output to the microprocessor is provided for by a 8237A Direct Memory Access (DMA) controller. Access to the microprocessor and data bus is handled by a 15-channel interrupt controller (a pair of 8259A's). An optional 8087 numerical co-processor is also available, but was not included in the configuration tested for this review.

Start up, and self-testing after start up are directed by an 8K read only (R/O) memory. The least amount of memory available to the user is 128K. NEC has chosen not to play the game of some manufacturers which offer a bottom-end system

SECOND HEX DIGIT	FIRST HEX DIGIT															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	16	SP	0	@	P	p	112	128	144	160	176	192	208	224	240
1	01	17	!	1	A	Q	q	113	129	145	161	177	193	209	225	241
2	02	18	"	2	B	R	b	114	130	146	162	178	194	210	226	242
3	03	19	#	3	C	S	c	115	131	147	163	179	195	211	227	243
4	04	1A	\$	4	D	T	d	116	132	148	164	180	196	212	228	244
5	05	1B	%	5	E	U	e	117	133	149	165	181	197	213	229	245
6	06	1C	&	6	F	V	f	118	134	150	166	182	198	214	230	246
7	07	1D	'	7	G	W	w	119	135	151	167	183	199	215	231	247
8	08	1E	(	8	H	X	x	120	136	152	168	184	200	216	232	248
9	09	1F	)	9	I	Y	y	121	137	153	169	185	201	217	233	249
A	0A	20	*	:	J	Z	j	122	138	154	170	186	202	218	234	250
B	0B	21	+	;	K	[	k	123	139	155	171	187	203	219	235	251
C	0C	22	,	<	L	\	l	124	140	156	172	188	204	220	236	252
D	0D	23	-	=	M	]	m	125	141	157	173	189	205	221	237	253
E	0E	24	.	>	N	^	n	126	142	158	174	190	206	222	238	254
F	0F	25	/	?	O	_	o	127	143	159	175	191	207	223	239	255



with only 64K of memory, which is not sufficient to run many programs. Additional memory for program use may be added to bring the total up to 640K. The balance of the addressable memory is set aside for the optional graphics package.

In addition, the system also contains 4K of Complementary Metal Oxide Semiconductor (CMOS) memory that is backed up with batteries, an 8048 microprocessor to control the keyboard, and a PD1990 chip that generates day, month, day of the week, hour, minute and second information. This clock is also battery-backed in order to keep the clock accurate when the power is off.

*the character set  
includes Greek and  
mathematical  
symbols*

Two double-sided, double-density eight-inch drives may be contained in the main housing. Drives are manufactured by NEC and are controlled by a NEC PD-765 floppy disk controller. For the monochrome model, the second drive is optional, but standard for the color version. The disk drives, which use a taut band, are not the quietest drives around. Using Digital Research's CP/M-86, each drive provides for 988K of program storage. When used with Microsoft's MS-DOS, each drive yields 1.25M of program storage. Even though they are double-sided and double-density, the drives will read a standard IBM 3740 formatted disk. NEC also supplies an external 5-1/4" Winchester hard disk drive as an option. A second hard disk may be daisy chained if required. Each hard disk gives 9.5M of storage under both CP/M-86 and MS-DOS.

A Centronics compatible printer port and a RS-232-C serial port are also standard features. Both of these ports use a Centronics-type receptacle, which is a design peculiarity for the RS-232-C port. The only other

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#### Circle No. 3

port available is the keyboard connector. It is not possible to add additional drives internally, but an additional serial port may be installed. Serial communications is handled by 8251 chips, which allow for either synchronous or asynchronous data transfer. Maximum data transfer is 19,000 bits per second.

Sound generation, which is performed by a D1771, allows for a pitch range of over two octaves, with three levels of volume. Note durations from a 1/32 note to a whole note are possible. An alarm feature, programmed separately from music generation, is also included. Four selective alarm frequencies, and three volume levels are feasible, with a duration that may be varied from a short 20-millisecond pulse to a continuous sound.

The NEC APC design seems at odds with the majority of today's high performance 16-bit computers. It does not follow the IBM PC trend of a three-piece unit, utilizing 5-1/4" drives. I suspect that NEC has realized that two disk drives of 320

to 360K capacity do not provide sufficient disk storage space for serious programming or business use. It is interesting to note how quickly the hard disk has become necessary in other models, but not in a NEC, with its large disk storage. For the user who wants to run more than one operating system, a dual eight-inch system is a real advantage compared with a system with two 5-1/4" drives or a single floppy and hard disk configuration.

NEC's floppy disks incorporate a delayed turn-on, which allows the computer to be powered on with a disk in place. After four or five years' adherence to all of the warnings about never turning power on or off with a disk in the drive, the NEC is strange. Equally strange, but very useful, is the ability of this computer to be powered down via software control. Imagine the computer in a business where a long sort is performed each day. The sort can be started during working hours, and when completed, the NEC will turn itself off. This automatic shut

down feature may also be used in conjunction with the built-in clock, so that shut down may be done at a preset time.

Documentation supplied with the computer consists of several 8 X 8", three-ring binders. Full details of all of the major integrated circuits are provided, as well as extensive lists of keyboard codes. Each operating system has its own manual and provides necessary information about specific related features.

Using a NEC APC equipped with color graphics is quite an experience. Character legibility using the green color is excellent. Using application programs requiring special keystrokes is easy on this machine when one of the templates for the programmable function keys is used. NEC has provided a recess above the function keys that holds these templates. I also used a 5M hard disk during the evaluation. Disk I/O was faster by far than with a floppy, but the disk is not as fast as several others I have used. The

only problem I noticed was that when text was generated using the magenta color, a slight misconvergence occurred on the left side of the display.

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*it is interesting to  
note how quickly a  
hard disk becomes  
necessary with  
other computers,  
but not with NEC*

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The NEC Advanced Personal Computer is a serious computer. The design has been well done, both on the outside, in terms of its looks and ease of use, and inside. Looking at an NEC APC with the cover off

reveals the same solid engineering that has long been associated with the NEC Spinwriter printers. All of the cables are carefully routed, with adequate clamping. Circuit boards are held down securely; yet the entire design allows for rapid replacement if that should ever be required. This is the type of computer that will run for hours, or even days, without excessive heat. At 19 X 14 X 18 inches just for the main housing, it is not a small computer, but this size is needed to enclose a system with this much capability. Perhaps NEC should have named it the Advanced Professional Computer. That would have been a better description.

I would like to thank my local NEC dealer, Modular Software Associates, Glendale, CA, for providing one of their NEC computers for this review, and for answering many questions about this machine.

For more information, contact NEC Information Systems Inc., at 5 Militia Drive, Lexington, MA, 02173. ®



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# THE FINANCIAL PLANNER FROM ASHTON TATE

by C. Len Horton

Early in the 1970's, corporations and governments that could afford it set up operations research/management science departments to study their operations. Using calculators, mainframe computers and time sharing networks, the highly-educated analysts in these divisions applied mathematics, statistics, queuing theory, linear and non-linear programming and occasionally common sense to try to solve problems.

The consensus of management, however, was that it was too expensive. The most useful analysis was often the most difficult to create without a computer and a number of very complicated programs. So, access to time sharing and its number of sophisticated statistical packages became a necessity, leading many companies to spend \$10,000 a month or more.

Operations research (OR) became something that was done almost exclusively by large, wealthy companies and governments with surpluses. Having an "OR" department became something of a status symbol.

During this time, a modeling language named Profit became available on time sharing networks. It offered the analyst the ability to use equations to model (or represent) the workings of his organization. Because of its power and its simplicity, Profit became one of the most useful tools for studying company operations and forecasting profits.

But because of its cost, Profit and time sharing never became widely used. The business world was waiting for something -- inexpensive computing power. The answer was the microcomputer with floppy and then hard disk storage.

## THE CALC PROGRAMS

One of the most popular and useful programs ever written for the computer was VisiCalc. It enabled analysts to use rows and columns on a computer display screen in the same way they used them on paper-only faster, much faster.

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*computing and  
modeling power  
comparable to Profit*

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When the power and usefulness of these spreadsheet modeling programs became apparent, thousands of managers and analysts rediscovered their appreciation for analysis and forecasting. Today, several studies have shown that more than half of all companies are now using calc programs to help project sales and profits.

As useful as they had become in making managers think and plan, spreadsheet analysis was too confined to cell (i.e., intersection of a row



*Len Horton, Atlantic Business Chronicles expert on the microcomputer marketplace, has written for several trade publications.*

and column on the spreadsheet) manipulations. To make complex modeling easier to do, a system (such as Profit) to handle a number of equations had to be developed.

### THE FINANCIAL PLANNER

Enter The Financial Planner (FPL) at \$695 from Ashton-Tate of Culver City, California. Famous for its dBASE II database program, Ashton-Tate has created a program that combines a spreadsheet with an equation management system. The result is computing and modeling power comparable to the Profit system on time sharing.

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*the program is  
designed to be  
useful in the  
real world*

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### FPL OVERVIEW

After installing FPL on a microcomputer (a straightforward procedure that is clearly explained in the user manual), the user types FPL and, after specifying the file-name and drive, gets a menu. This menu is an overview of the program.

There are six options to choose from. You can go into Editor to create or modify a model, you can use DSS (the decision support system), you can use Select to tell FPL what parts of each model are on what diskettes, you can reconfigure FPL, you can change to a different model and you can EXIT or quit.

Most of your work is in Editor and DSS. Editor enables you to define the model as having X rows and Y columns. For example, you type "ADD ROWS" and FPL responds with 1 1/2. You can then type "RESERVE 30" and 30 rows will be created. If you want (and you probably do), you can name each row individually. You set up your columns the same way.

After typing "ADD COLUMN", an interesting feature of

FPL is the MONTHS command. It automatically creates and labels JAN through DEC columns and adds a total for the year column. A small touch, but a nice one.

In Editor, you are describing the model. The real excitement begins when you finish creating the model and go into DSS. Ashton-Tate has designed FPL to help solve common, aggravating problems.

If you're evaluating the implications of an annual sales goal of 10,000 units, you don't have to bother with dividing 10,000 by 12 to find out the monthly figures. All you have to do is type 12S10000. This "spreads" 10,000 over 12 months. It's fast and pretty and cuts the hassle.

Suppose sales are at 1,000 units in January and your sales plan calls for 20,000 units by December. If you're showing unit sales on row 3 and the columns represent months, type R3=1000,120000. This "interpolate" command lets you specify a beginning and ending figure and have FPL fill in the middle with a steady growth pattern.

While this capability is not earth shattering, it indicates that the program has been designed to be useful in the real world. It shows attention to detail that makes you appreciate Dennis Brown, the man who wrote the program.

No, it's not perfect. The grow command (1/2) does not permit you to grow through exponentiation, even though it is listed as an option. With other grow commands, you can, for example, make a time series increase or "grow" by adding or subtracting a number or by multiplying or dividing by a number. The command R6=1000,1/2+50 puts 1000 in row 6, column 1, and then 1050 in row 6, column 2, 1100 in row 6, column 3, etc.

### FPL'S EQUATION HANDLING

Ashton-Tate decided to call them Rules so they wouldn't scare so many people. Equations sound like something Einstein fiddled with; rules we lesser mortals can certainly live with.

The Rules section of FPL tells the program how to perform the computations and in what order.

TOTSALES = (PRPROD1 \* PROD1) + (PRPROD2 \* PROD2) is a rule. It tells FPL that total sales equal the sum of the price of product 1 times the number of product 1's sold and the price of product 2 times the number of product 2 sold.

By writing the appropriate equations in the right order, an intelligent analyst can model almost any system using FPL. These rules can contain IF statements, enabling you to get FPL to take action on a conditional basis. Boolean algebra with logical AND and OR statements is also a snap.

For analysts who want the ability to solve simultaneous equations, FPL is a delight. Using its LOOP command, FPL will repetitively execute a group of rules or equations until the difference in a specified variable (such as total sales) is too small to bother with. This means that you can use FPL to solve linear programming problems where you are trying to maximize, for example, revenues subject to a number of constraints. Or minimize costs subject to meeting a number of conditions.

### COMPUTING AND PRINTING REPORTS

Unlike some calc programs, FPL gives you top and bottom margin control, footnoting, the ability to print selected portions of a model and more flexibility than most spreadsheet programs. But it offers another capability worth mentioning.

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*the management  
scientist and the  
decision scientist  
have a system  
worthy of their skill*

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With FPL, you can create a file that contains all the commands for printing out the reports you want. Then by typing FROM A:FILE

NAME.EXT, FPL begins taking commands from this file and continues until the end of the file is reached.

If you need to, FPL will query you for information from a file. And one of FPL's most useful and powerful features is nested command files with an AGAIN statement. AGAIN serves the same purpose as NEXT in FOR...NEXT sections in BASIC programming. Imagine what you could do with this.

One use is sensitivity analysis. What happens to your profits before taxes as you change your price of product A? Using FPL's command files with the AGAIN command, you can run through a number of scenarios and create, for example, a table showing product A price versus profit before taxes for price beginning at, say \$5 and going all the way to \$15, in increments of a dime.

For faster sensitivity analysis where you are interested in seeing the effects of changes in the rules of your model, FPL offers the WHAT IF command. As each new rule or equation is entered, the entire model is recalculated accordingly.

This is a lot of computing power in a microcomputer program.

#### **SOME PROBLEMS**

FPL, to be blunt about it, is too complicated for many users. For the user who wants to make use of a spreadsheet so he can talk about it at his golf club, FPL is not the answer. While few managers will take the time to learn how to use a program this complex, analysts will love it. It was designed to make them happy.

FPL really does offer most of the computing power of more expensive programs available on time sharing networks. At last, the operations researcher, the management scientist and the decision scientist have a system worthy of their skills.

#### **ANOTHER PROBLEM**

You would think that in this day of the word processor and spelling checker, vendors would at least bother to run their manuals through a spelling checker. Right on the cover of the FPL manual are the

words, "User Manual". Inside the cover, page 9 for example, is "satisfy". On page 14 is a grammatical mistake: "Each...are".

I believe that some day successful companies like Ashton-Tate will care about spelling and grammar. Maybe proofreading too. On page 23, they write R3 when they mean R6, and on the same page, R3 when they mean R7. On page 24 they say Chapter 20 when they mean Chapter 17. So it's more than spelling and grammar -- it's proofreading. A housewife English major working part-time would solve the problem. This would please snobs like me who wasted my time learning how to spell and achieve subject-verb agreement most of the time.

Ashton-Tate did, however, spend time creating a good index and used dividers to make it easy to find any desired section of the manual.

#### **FINAL EVALUATION**

FPL is one of the finest modeling/spreadsheet programs available for microcomputers. It is, however, more suitable for analysts than for managers. Dennis Brown, FPL's


author, is to be commended for this program as is Ashton-Tate for recognizing its capabilities.

#### **Evaluation Summary of The Financial Planner**

**Performance/Power A (Excellent)**  
Can replace time sharing programs  
**Ease of Use C (Acceptable)**  
Not recommended for management use; Would be A for analyst use  
**Documentation B (Good)**  
Would have been A but for spelling/grammar/proofing  
**Installation Ease A (Excellent)**  
Straightforward, no problems  
**Errors A (Excellent)**  
No lockups; mistakes handled well.

#### **RECOMMENDATION**

The Financial Planner is recommended for modeling applications where a number of equations are required and where someone (an analyst) can devote the time required to become an expert in its use. The time investment, would be well rewarded.

For more information, contact Ashton-Tate at 10150 W. Jefferson Blvd., Culver City, California, 90230. 

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# TURN YOUR KAYPRO INTO A TRS-80

by Carol Buchanan

UniForm by MicroSolutions is a multipurpose translator. It is a program for the person who bought one computer and a few months later wished he or she had bought another one. It's for the owner of one system who needs to upgrade to another system because he's outgrown the first one, but is afraid to do so because he has too many files on the old system. UniForm is for those of you caught by the Osborne bankruptcy and worried about all the files you wrote on the Osborne 1 when you need to upgrade your system, too.

UniForm frees many computer owners from being locked into one computer system. With UniForm,

you can change from one CP/M-based computer to another or read MS-DOS/PC-DOS (versions 1 and 2) files on a CP/M machine. You can also read CP/M files on MS-DOS/PC-DOS.

If you're a software developer, writing in a high-level language, you can run your program through UniForm before it's compiled, and then run it on MS-DOS/PC-DOS as well as CP/M. "For a software developer, if you're careful about your software, and don't write to the hardware, this compares favorably with programs costing thousands," says Jim Cook, VP Engineering for ComputerSource of Bellevue, WA.

## AVAILABILITY

At this writing, UniForm is available for Kaypro 2, 4 and 10, the Osborne 1 double density (DD), the Actrix (formerly Access Matrix), the Morrow Micro Decision, the Epson QX10, and Televideo TS803, with more to come, according to Ron Proesel, President of MicroSolutions. It supports 37 CP/M disk formats in the version provided for the Kaypro 4.

## HOW IT WORKS

UniForm substitutes itself for the Basic Input/Output System (BIOS) and stands between the Basic Disk Operating System (BDOS) and the Central Processing Unit (CPU). UniForm intercepts disk functions routed to Drive B. It puts in its own set of drives that have the characteristics of the drive you are emulating.



With UniForm, text and ASCII files are moveable and "runable," but .COM files aren't because object codes won't run between different machines. It will format a disk for operating systems other than CP/M, but won't set drive B to anything other than CP/M.

### WHAT IT IS

UniForm is really a collection of programs. It offers file copy and file conversion programs for CP/M<->MS-DOS/PC-DOS and CP/M<->TRSDOS. It lets you display the directories for any of the initialized or copied disks. But its main features are the two programs, INITDISK and SETDISK.

INITDISK formats a disk, or as the MicroSolutions people call it, "initializes" a disk. They've developed that term to avoid any confusion for the user by having two separate functions for the word, "format." When they talk about format, they mean the layout of a disk. "Initializing" means to conform a disk to any of the formats listed on the program's main menu.

SETDISK turns Drive B into another machine in which you can use initialized or copied disks.

I ran UniForm on a Kaypro 4, used SETDISK and INITDISK with Texas Instruments PC and copied CP/M to MS-DOS and back on TeleVideo. Being menu-driven, UniForm is as easy to use as its 11-page manual claims.

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***with UniForm you  
can change from  
one CP/M based  
system to another***

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To use UniForm, first insert your CP/M system disk into Drive A and type <ctrl> C. Then take it out and put in the UniForm disk. Type <ctrl> C. You will see the main menu on the screen.

1. Setdisk
2. Initdisk
3. MS-DOS/PC-DOS<->CP/M file copy
4. TRSDOS/LDOS<->CP/M file copy

At this point, it gives you the option to continue or to quit by typing RETURN.

Select option 2. The screen now displays the list of disk formats available on your version of UniForm. This list varies from one computer to another, but for the Kaypro 4, they have two lists, one for single-sided and one for double-sided disks. Some of these include Osborne, TRS-80 Models I and III, NEC, IBM PC (CP/M-86), Superbrain, Cromemco, HP 125, TeleVideo, Morrow, Zenith, and versions 1 and 2 of MS-DOS/PC-DOS.

After you make your selection of which disk format to emulate, the system again gives you a choice of continuing or quitting.

To continue, put a blank disk in drive B and RETURN.

INITDISK will now format or "initialize" and verify each track. At the same time it displays a message on screen alternating between "Initializing" and "Verifying" to let you know what it is doing. If there are problems with the disk, UniForm will display a "Retry" message to tell you that it is reinitializing that track. If the retry count reaches 9, INITDISK will abandon that track as a permanent error and go on to the next. At the end, it will tell you how many permanent errors there are.

When you are finished, press RETURN to go back to the main program menu.

Now that you have a disk which conforms to another format, you can either run it in that machine or make your computer's B Drive into the other computer to run your "foreign" disk on.

To use SETDISK, either enter the program from CP/M as we showed you for INITDISK, or go right into it after initializing a disk by typing 1. Again, the program will display the list of formats for you to choose from. This could be, for

example on a Kaypro 4, any of 44 machines, some of which duplicate the list above, and add Xerox 820 single- and double-density.

You just need to remember that SETDISK will work only on disks created under CP/M. Disks from a computer listed on the menu that weren't created with the CP/M operating system will not work.

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***Uniform is a utility  
that programmers  
and fileclerks alike  
can use***

---

Type the letter of your choice, and the screen will display this message:

Drive B set to: Your Choice.

At this point remove UniForm from Drive A and insert a CP/M disk with your text file and PIP.COM into Drive A. Type a <cr> to exit the system and PIP over the file from Drive A to Drive B just as if you were moving files from one CP/M disk to another.

The PIP command would read:

A>pip b:=a:YOURFILE.TXT

After PIP is through copying the file, it will return to the CP/M prompt A>. You now have a file that you can read on another machine.

To copy from the other format to your computer, follow the steps above, but reverse the drive directions on the PIP command to copy from Drive B to Drive A.

UniForm also includes two programs to allow you to copy files between MS-DOS/PC-DOS and CP/M or between TRSDOS/LDOS and CP/M. To do so, load UniForm as above and select, for example, option 3. Then, simply follow the directions on the menu. The CP/M disk needs to be in Drive A with the MS-DOS/PC-DOS disk in Drive B.

INITDISK will format MS-DOS/PC-DOS disks for you, but once again, remember that CP/M programs won't run on the other system.

You can, however, move a document written with a CP/M editor from CP/M to MS-DOS and then run a MS-DOS based version of the same editor on that document. WordStar is one example of that type of editor.

UniForm also offers a feature called the file range, which is designed to make the process of copying easier. Instead of your having to type all the names of files you want to copy, the system displays a directory of the disk and gives the files numbers. To copy files, you just type in the numbers of the files you need to copy. The ranges can be itemized singly, as 5, 12, 37. This means you want to copy files 5, 12 and 37. They can be inclusive, as -5, 10, -13. By this method, you have commanded the system to copy files

0 through 5 and 10 through 13. Or you can tell the system to copy any combination of single and inclusive file range numbers.

### FACTORY SUPPORT

It is company policy, according to Proesel, that "we'll send a new disk to anyone who calls once we recognize that there is a problem." This backup service is at no charge to the customer. Proesel put turnaround time at the same day if a customer sends the disk to be fixed, and "a couple of days" to replace a defective disk with a totally new disk.

In actual fact, however, it may take as long as three weeks to receive a replacement disk, but MicroSolutions does stand behind its product.


### CONCLUSION

First issued with the Kaypro 2 in March of 1983, under a licensing agreement with Non-Linear Systems, Uniform is now sold on the

open market for \$50.00. The moderate price is MicroSolutions' policy. Said Proesel, "A piece of software will be purchased if the purchaser thinks it's a good value." Previously, disk conversions costs were around \$25.00 per disk.

Recently, MicroSolutions has even lifted the copy protection that made it difficult to make more than one working copy from the master disk. The idea is to make UniForm as accessible and easy to use as possible. In our opinion, they have succeeded. Its simple menus hide a very sophisticated and well-written program, and its documentation is as succinct and clear as it could be.

UniForm is a utility that programmers and file clerks alike can find useful in designing programs or copying files from one system to another.

For further information, write: MicroSolutions, 125 S. Fourth St., DeKalb, IL 60115. 

## Inter-Office Correspondence

### SEATTLE OFFICE

Memo editor: Enter mail  
Date: 11/30/83  
From mailbox: 709 - Jack Spears  
To mailbox: 101 - Will Pierce  
Subject: Electronic Mail Manager  
Special delivery: No  
Return receipt: Yes  
Copies to: None  
Attached files: No  
Will,

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### LYME STREET OFFICE

Memo editor: Enter mail  
Date: 11/30/83  
From mailbox: 101 - Will Pierce  
To mailbox: 102 - John Fall  
Subject: Board Meeting tomorrow  
Special delivery: Yes  
Return receipt: Yes  
Copies to: 5 mailboxes  
Attached files: Yes  
Hi John,

The board meeting will be held tomorrow morning at 10 A.M. This Electronic Mail Manager sure makes communications between our offices easy and fast. The new budget forecast is attached in xYCALC format. Let me know if you approve.

### LA OFFICE

Memo editor: Enter mail  
Date: 11/30/83  
From mailbox: 102 - John Fall  
To mailbox: 101 - Will Pierce  
Subject: Board Meeting tomorrow  
Special delivery: Yes  
Return receipt: Yes  
Copies to: None  
Attached files: Yes  
Will,

The budget forecast looks good except that I have revised the year end projections to include new market trend figures. I have returned the new setup in xYCALC. See you at tomorrow's meeting!

### SOUTH STREET OFFICE

Memo editor: Enter mail  
Date: 11/30/83  
From mailbox: 908 - Lara Wilks  
To mailbox: 101 - Will Pierce  
Subject: New Product Release  
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Return receipt: Yes  
Copies to: All  
Attached files: No  
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# ONLINE DATABASES

by George Fletcher  
and Glenn Mills

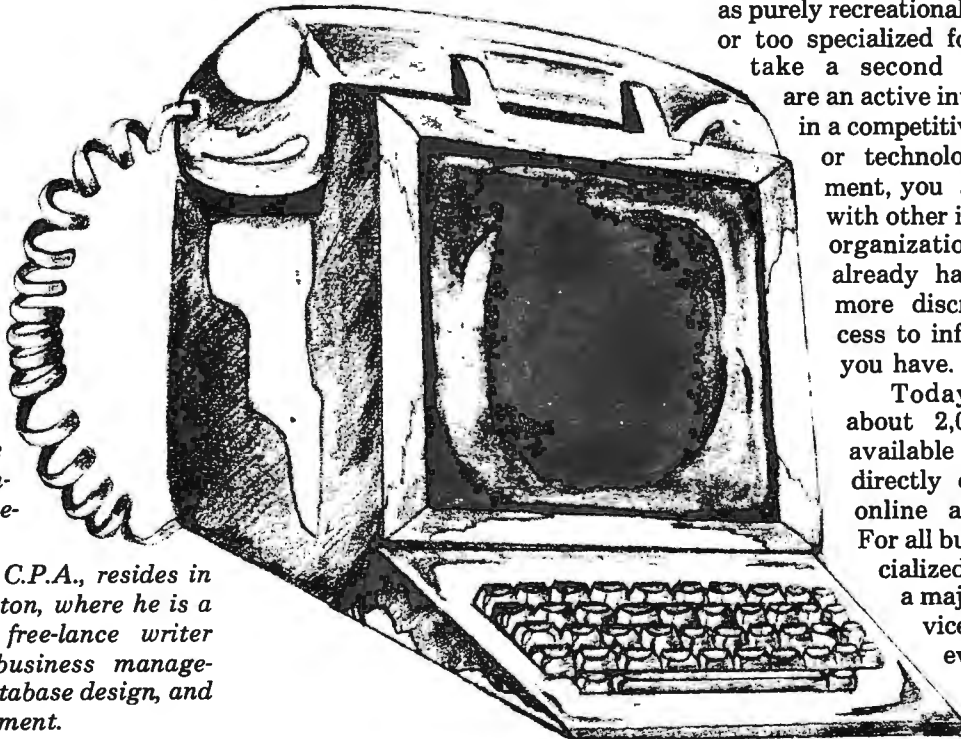
This is the first of a series of articles on the subject of electronic information utilities. In this issue, we will present a brief overview of online services and some tips about hardware and software requirements to help you get started. Since we can't cover the subject in a single article, we will begin in the March issue to bring you an in-depth look at some of the other major online information systems beginning with Dialog and Knowledge Index.

Online information systems grew out of the computer timesharing services and several key government-sponsored database projects developed over the last decade. Thanks to the intense competition which is characteristic of the computer and publishing industries, online systems and services are

becoming increasingly comprehensive and user-friendly. The ubiquitous microcomputer is placing information workers in an ever more dominant role in our economy. One estimate is that over half of all jobs in this country are information-related. All this means that information systems and the skills and tools that are necessary to use them are becoming indispensable to individuals and organizations whose competitive edge depends, to some degree, on the timeliness, quality and selectivity of the information they have available.

Many microcomputer users have perhaps heard of Compuserve, The Source, and the Dow Jones News/Retrieval, and have a general idea of what an online database is. If you have discounted such things as purely recreational, too expensive or too specialized for your needs, take a second look. If you are an active investor, or work in a competitive, professional or technological environment, you are competing with other individuals and organizations who may already have faster and more discriminating access to information than you have.

Today there are about 2,000 databases available online, either directly or through an online access service. For all but the most specialized requirements, a major retrieval service may provide everything you need through a single source.



*Glenn Mills is quality systems supervisor for Lockheed Marine in Seattle, Washington, and a freelance writer.*

*George Fletcher, C.P.A., resides in Seattle, Washington, where he is a consultant and free-lance writer specializing in business management systems, database design, and software development.*



For example, Lockheed's "Dialog Information Retrieval Service," one of the pioneers in the business, currently lists nearly 200 entries in its catalog of databases, containing about 80,000,000 individual records. Each database is supplied by a publisher/vendor who is responsible for updating the information daily, weekly or monthly. If it is not a full-text database, the vendor must also maintain a skilled crew of professional researchers who know enough about a subject area to produce useful abstracts for each citation. Billing for access time, units of information retrieved and telecommunications charges are all handled through Dialog. As might be expected, such services are relatively expensive and are not intended to replace a casual browse through the public library.

Other services provide highly specialized databases to serve the needs of a particular user group. For example, if your interests are financial, Dow Jones News/Retrieval may be the first place to look. Offered by the publishers of the Wall Street Journal, it is by far the most widely used interactive information service with over 100,000 users. If you need stock market quotations, financial and economic statistics, corporate financial data and general news of interest to active investors, this one may be as indispensable as the Wall Street Journal itself.

Intensive research capability is just one end of the spectrum of information services. While major corporations, brokers, and professional researchers have for years been willing and able to pay the price for electronic information retrieval, the general public only recently has had widespread access to the basic equipment necessary to go online. The Source, a subsidiary of Reader's Digest, struggled for several years until the surge in microcomputer sales in 1982 created a demand for online services geared more toward the consumer and small businesses. Today, almost everyone who uses a microcomputer has at least heard of The Source. With upwards of 30,000 users, it is one of the most popular online systems.

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## *dialing your favorite network can be as easy as calling your grandmother in Kansas City*

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Offering electronic mail, computer conferencing, news and business information, job searching, online shopping, reservations, and even games, The Source is an interactive information utility truly designed for consumer use.

Compuserve, a service of H & R Block, is even more attractively priced. Operating primarily at night, the costs have been modest enough to attract a large number of subscribers (over 40,000) who log equally large numbers of hours. It has business and financial news and services, electronic editions of magazines and newspapers, electronic mail, bulletin board services, special interest group newsletters, electronic shopping services, and games. It may be easier to compile a list of what Compuserve doesn't offer. Whatever your interests or hobbies, Compuserve probably has something for you.

## **HARDWARE & SOFTWARE CONSIDERATIONS**

Telecommunications is a highly technical field. However, if you are interested primarily in the information at the other end of the line, the hardware and software that provides you access will (like telephones, radio and television) become almost transparent. Connecting with an online information system can be easy if you resist the temptation to make things more difficult than necessary. Accessing online information systems requires little understanding of the technology of telecommunications, and you will find that the whole process seems less formidable after you have successfully made the first connection. Perhaps the most difficult step is making a decision as to what equipment and software to purchase before you have had first-hand experience.

Many of our readers already know that the equipment necessary to tie into an online service is readily available, and neither expensive nor hard to operate. When shopping for the right equipment, the best way to get what you want is to be aware of the various functional options and the major trade-offs if cost is a limitation.

The list of essential items is very short: a computer, a modem, and communications software. If you are on a tight budget, a terminal and modem alone can do the job. The added features of a computer, such as mass storage, a printer and word-processing software will be very useful, but you can get by without them.

Stand-alone terminals vary widely in ease of use for online access. If it is your intent to connect directly, without an intervening computer, look for a unit with the communications settings made either through switches which are readily accessible on the OUTSIDE of the cabinet or through the keyboard.

The terminal should have an auxiliary printer port. Even if you think you don't want printed output, make plans now in the event that you change your mind. The only way to save the information you receive

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Circle No. 48

on line without the help of a computer is to print the transmission simultaneously through a printer port on the terminal. Have the vendor demonstrate a working configuration. To be successful, your printer speed in characters per second (CPS) must be significantly faster than the transmission speed.

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***a 1200 baud Modem  
can result in as  
much as a 50%  
savings in the cost  
per character  
printed***

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This means that a 120 CPS dot matrix printer will work fine at 30 CPS data transmission rate, but not at 120 CPS. The terminal should have an auxiliary printer port. Since the interface must be of the serial (RS232) type, your printer must also have a serial interface.

Printer interfaces warrant careful consideration if you are about to purchase a complete system. Interfaces between printers and computers come in two types—serial or parallel. Generally speaking, parallel interfaces can be plugged in and used immediately, while serial interfaces may require some specific reconfiguration of the computer-to-printer connection in order to work properly. With the proper documentation, this is not difficult to do, but it saves a lot of time if you purchase a WORKING configuration. Since most printers are sold with either parallel or serial interfaces, and not both, you should plan ahead if you want to use the printer in more than one system. Some have both serial and parallel interfaces built in, providing the advantages of the parallel printer with the ability to plug into the back of a stand-alone terminal.

If you are purchasing a computer for online communications, be sure that communications software is available. Good communications software is the key to your link to the information network. All the popular CP/M systems have both commercial and public domain software available. If you are considering a lesser-known system, it is a good idea to request that your vendor demonstrate the communications capability as a condition of your purchase. It is important to remember that each type of computer requires a different installation, a task you may not want to tackle yourself. If you can't find a vendor who can put it all together for you, join a local CP/M or computer user group before you buy your system. Almost any type of computer user group will have a number of members who are very active in telecommunications and are willing to share information on their favorite subject. This may also be a source for obtaining a copy of public domain software for your CP/M computer.

The CP/M community is fortunate to have MODEM 7 in its many variations available on almost every popular machine. Since MODEM 7 is public domain software, you can get it for free. It isn't easy to make a case for purchasing software when MODEM 7 is available, as it provides the necessary communications settings to meet the requirements of the online networks and has most of the file sending and receiving features of the commercial packages. Unless you have a specific need for some special features, save your money. There are some differences, but they are not of particular significance to the average online database user using a CP/M 80 machine.

In deciding on communications software, the essential requirement is to be able to make your system look like a terminal, configurable to several standard communications protocols and transmission speeds. Also, the system should provide a way to trap the information arriving on your screen into a memory buffer or directly to a disk file. If you plan to transfer data either to or from your machine, select a system which

provides some type of error checking. An autodial feature automatically sets specific communication parameters and calls the number from a stored phone list. This is a highly desirable feature and is becoming standard on commercial systems and many versions of MODEM 7 as well. There are at least 25 communications software products available for CP/M systems, all having much the same basic features and various extended capabilities which you may not need if your only objective is to connect to online database networks. Try to select a package which seems to be the easiest to use unless you have a need for a specific function not found in other systems.

The next thing to consider is what modem to purchase. "Modem" stands for "modulator/demodulator," which means simply that it converts the digital signal to and from a computer to an analog (voice communication) signal which can be transmitted on a standard voice-grade telephone line. This is another interesting technology which, even if you knew and understood it all, would add almost nothing to your ability to participate in the online database networks. Your basic choices with respect to the modem center on price, physical interface, reliability and ease of use.

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***the CP/M community  
is fortunate to have  
MODEM7***

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Approximately fifty manufacturers offer about two hundred different modems applicable to the online database user. Prices range from less than \$100 for something that will get you by to nearly \$1000 for a first-class unit with all the features you could ever want. The more you spend, the more you should know about what you are purchasing. Your choices revolve around physical interface, transmission

speed (there are two options), duplex (look for both FULL and HALF duplex) and convenience features such as auto-dial/auto-answer and internal diagnostic capabilities.

The acoustically-coupled modem was once the only inexpensive kind available, but it is becoming less common with the introduction of direct-coupled units. The connection is made by inserting a standard telephone earpiece into the modem. Being typically less reliable, because of occasional external noise interference, problems in the acoustical signal, and general inconvenience, this is probably not the best choice. Direct-coupled modems are not necessarily more expensive than acoustical models, and have the advantage of a more positive connection to your phone line.

If you are willing to spend a few hundred dollars to make your hardware more invisible, software controlled auto-dial modems are worth the additional cost. When coupled with a compatible communi-

cations package (most popular communications products will have this compatibility), dialing up your favorite network can be as easy as calling your grandmother in Kansas City. The most widely used communications software products let

**Dow Jones**  
**News/Retrieval is by**  
**far the most widely**  
**used - over 100,000**  
**users**

you store the phone number and the communications settings of all the systems you may want to use, so that all subsequent accesses may be initiated with a single command.

You won't have to keep a cryptic note to yourself taped to the front of your computer. If you plan to use a number of online databases in your work, the fully automated configuration should pay for itself in terms of time saved, especially if a number of non-technical employees will be using the system.

One of the technical terms that cannot be avoided is "baud rate," which refers to the speed that data is transmitted between computers. All you really need to know is that you will be dealing with two options: 300 baud, or about 30 characters per second, which is the most common, and 1200 baud (120 CPS), the high-speed alternative for those who are equipped with a more expensive modem. Whichever one you select, the low-speed modem should be designated "Bell 103" standard, and the high-speed, "Bell 212A," to assure compatibility with the networks.

A word of caution: once you have experienced 1200 baud commu-

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nications, you will probably find it hard to return to 300 unless you are forced to. Depending on screen formats, 120 CPS is generally just a little bit faster than most people can read comfortably. Since most services stop and wait after each page of data, this is no problem. On the other hand, 30 CPS is much slower than most people read, and there is nothing you can do to make those lines of text arrive any faster. Most major information services have a 1200 baud option, usually at double the standard rates. This can result in as much as a 50% reduction in the cost per character printed on your terminal. The savings may be offset slightly by a doubling of the cost of idle time you spend online making decisions as to what to do next. Active online database users, especially researchers, should find that the up-front cost of a high-speed modem is eventually returned in reduced connect time charges.

There is one last small technical matter that may or may not affect you. Your serial port, which you will use to connect to your modem, should be one of two common types. Stand alone terminals and many computers are configured as "Data Terminal Equipment," or "DTE," and modems are configured as "Data Communications Equipment," or "DCE." This means that the cable connecting the two is directly compatible, requiring no

special wiring. If, however, your computer port is also DCE, you will need to cross over the wires connected to pins 2 and 3 at one end of the cable. This is not difficult, and is one of the first things to try if you think you have everything else set up correctly and you cannot establish a connection to your modem, another good reason to ask your vendor to demonstrate a working configuration.

When you actually sit down to your terminal or computer to dial up for the first time, remember that basic online access does not require a lot of split-second decisions. Unless you have direct-dialed into the system, your charges don't start running until you have actually connected and the password is accepted. Whether you are using a computer or just a terminal, the only decisions to make are Transmission Speed (baud rate) and Full/Half DUPLEX, Parity (Odd/Even/None), Auto Linefeed, and Remote Echo ON/OFF. While these terms may be like a foreign language to you, hooking up to a major commercial network is surprisingly simple. All of the widely used systems tell you exactly what settings to use, and if you need assistance, most provide free telephone customer service during normal business hours. Support personnel are generally knowledgeable and experienced in talking the novice through his or her first dial up.

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Circle No. 7

## IN PERSON *Continued from Page 20*

realize how industry works out there. They have barely caught up with the Z80. Look around at the products coming out now using Z80's and 68000's, machine tools and automotive applications. The S-100 still offers a lot of flexibility. There is a lot of industrial interest from such areas as the Army, Navy and Air Force, and a full 50% of our business comes from OEM's and component accounts, a continuing growth market.

**CP/M REVIEW:** *Earlier you referred to European customers. Has CompuPro established overseas distribution?*

**Godbout:** We have Comcen Technology in Wales, and they have

offices in London as well. They are our European distributors just as Byte Industries is our United States distributor. We have also established a Distributor in Australia called Automation Stratham.

**CP/M REVIEW:** *Is the S-100 still performing well from the product marketing point of view?*

**Godbout:** It is still ahead of projections in terms of product growth. The S-100 is really just starting to come into its own. The new products that promise more power and speed will only add to the growth potential of an established design, now that the industry is recognizing it as a stable and rugged standard.





# CB68 CBASIC COMPILER

by Caddy McCall

The CBASIC compiler for the Motorola 68000 processor is here for those who want or need to transport their applications to the 68000.

I am running CB68 on a TRS-80 Model 16 with the Tandy hard disk. The CP/M-68K operating system is from Trisoft, 4102 Ave G, Austin, Texas 78751. The Z80 is handled by Pickles & Trout CP/M. This hardware is designed from the ground up to be a multi-user system. The 68000 processor has been confined to the back room and does nothing but crunch data provided it by a 64K Z80 which handles all input and output of data. In this system, it is not possible to determine the relative input or output speed of the 68000 programs since all data must pass through the Z80. All references to the speed of the compiled programs will be confined to internal processes.

This arrangement is very convenient. It allows one to run all the CP/M-80 software PLUS the emerging CP/M-68K software on the same computer from the same hard disk or diskettes and to access the same data files without even flipping a switch.



*Caddy McCall, a native of Texas, is a banker with a BA in mathematics. His experience includes real estate investment and venture capital financing.*

CB68 is indeed a CBASIC compiler and looks to be the exact same language as CB-80, including the graphics extensions. This is not to say, however, that the two are exactly compatible. Some applications using many overlays may be difficult to convert from CB-80 to CB68. I'll get to that in more detail later in this article.

The first thing you will notice about the CB68 compiler is that it is slow to compile and link—very slow. A short one-page program that CB-80 compiles and links in forty-two seconds takes CB68 three minutes and

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*in some operations CB68 is  
actually slower than CB-80*

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twenty seconds to compile and link, and this is with a 50% faster clock speed. Adjusted for clock speed, this is seven times longer for the CB68 compiler. Ahhh, but the execution speed will sure make up for the wait, right? Let's see.

## SPEED OF EXECUTION

To compare the execution speed of CB68 against that of CB-80, the following simple loops were used to time the very simple operations from which most programs are built. The timings will probably surprise you, they surprised me.

EXECUTION TIMES (SECONDS)  
AVERAGE OF 4 RUNS

	CB80 Z80 4Mhz	CB86 8088 8Mhz	CB68 M-68000 6Mhz
real number addition for I% = 1 to 10000 a = a + 13579.10 next I%	8.29	4.59	6.12

real number multiplication	41.05	22.33	22.34
for I% = 1 to 10000			
a = 13579.10 * 24680.34			
next I%			
real number division	102.5	49.04	99.99
for I% = 1 to 5000			
a = 13579.90 / 2468.07			
next I%			
integer multiplication	15.95	8.78	15.06
for J% = 1 to 60			
for I% = 1 to 10000			
a% = 13579 * 246			
next I%			
next J%			
integer division	15.90	8.76	14.95
for J% = 1 to 60			
for I% = 1 to 10000			
a% = 13579 / 246			
next I%			
next J%			
integer addition	20.35	9.60	16.33
for J% = 1 to 60			
for I% = 1 to 10000			
a% = a% + 13579			
next I%			
next J%			
move a string	5.5	3.22	6.0
b\$ = "abcdefghijklmnopqrstuvwxyztuiow"			
for I% = 1 to 10000			
a\$ = b\$			
next I%			
empty loop	17.6	10.12	19.3
for I% = 1 to 1000			
for J% = 1 to 1000			
next J%			
next I%			

Note that the number of repetitions of each loop was adjusted to produce a convenient time interval. The raw times are not strictly comparable from one operation to the next on the same processor. They are, however, comparable from one processor to the other for the same operation. When allowing for clock speed, it is evident that in some operations, CB68 is actually slower than CB80. This same effect has been noticed in other software which has been transported from the 8080 version to 16-bit processors.

The graphics routines have added some new reserved words to both CB-80 and CB68. The list is almost certain to wreak havoc on all your prior source code. New reserved words are:

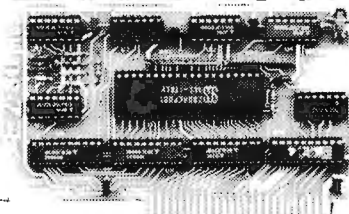
AT	COUNT	POSITION
ASK	DATES	SET
ANGLE	DEVICE	STYLE
BEAM	FILL	TET
BOUNDS	GRAPHIC	TIMES
CHARACTER	HEIGHT	TYPE
CLEAR	JUSTIFY	VIEWPOINT
CLIP	MARKER	WINDOW
COLOR	MODE	

Some of these will not cause problems, but I expect AT, ASK, BOUNDS, CHARACTER, CLEAR, and DATES will raise a few eyebrows.

Additional problems in converting prior applications will arise from the CHAIN statement. In CB-80, the CHAIN statement can load either an overlay or a .COM file. If the program being chained to has a name different from that of the last .COM file executed (that is, the program chains to a new program, rather than an overlay), the COMMON data area is cleared. If the name is the same, this area is left intact. This allows a CB-80 program to chain to an overlay, or two, or three, and then to chain back to the root program with the COMMON area intact. I have seen quite a few applications which use this feature to combine a collection of very small programs into a menu driven system that looks like a single large application program.

CB68 does this somewhat differently. When CB68 chains to an overlay, the entire root program is retained in memory. Chaining back to the root clears the stack and all COMMON data is lost. This will make it more difficult to pass data from one program to another when using the CHAIN feature.

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## THE COMPILER

The CB68 compiler seems to be identical to CB-80. The compiler directives and command line toggles are exactly the same. I did not compare each of the 117 compiler error messages, but taking about every tenth message, I did not find any differences. The list of execution error messages has been expanded slightly. Some of these messages are unique to the 68000 version, some of them would be nice to have in the 8080 version, especially the MO message -- Overflow has occurred during integer multiplication. Perhaps it will be added.

## THE LINKER

The linker, because of the way the 68000 processor uses memory, must be and is completely different from the CB-80 linker. The command line syntax is not even similar. All your .SUB files will have to be revised.

The linker accepts input from both object files and library files. Library files can be created with the CP/M-68K utility program AR68.

LINK68 provides many options unique to the 68000. Some of them can be applied globally and some locally. Global options apply to all the files being linked in a command line. Local options apply only to a specific file in the command line.

### LINK OPTIONS

- ABSOLUTE:** Generate an absolute file. Default is to a relocatable file.
- ALLMODS:** Load all the modules from a library even if they are not referenced.
- BSSBASE:** Set the base address for the uninitialized data segment.
- CHAINED:** Creates a command file that does not use a true overlay but rather chains from one file to another.
- COMMAND:** Get the rest of this command line from a file.
- DATABASE:** Set the address of the data segment.
- IGNORE:** Ignore 16-bit address overflow.
- INCLUDE:** Link an unreferenced module from a library.
- LOCALS, NOLOCALS:** Include or quit including local symbols in the .O file.
- SYMBOLS:** Put the symbol table in the output file.
- TEMPFILES:** Use specified drive for temporary working storage.
- TEXTBASE:** Set the base address of the text segment.
- UNDEFINED:** Ignore undefined symbols in the input files. Print a list of the undefined symbols but keep processing.

LINK68 gives over 30 error messages, which of course are not the same as the LK80 messages due to

the differences in the 8080 and the 68000 processors.

## ATTENTION UNIX FANS

Output redirection is provided by LINK68. A typical (simple) link command line might look like:

```
A>LINK68 68KPROG = MODULEA, MODULEB
```

This line will send the output to the console. Now get this:

```
A>LINK68 68KPROG = MODULEA, MODULEB  
> b:lk68out.msg
```

will send the linker output to the file LK68OUT.MSG on Drive B.

Wouldn't it be great if someone at Digital Research slipped this feature into the CP/M operating system?


## DATA STRUCTURE

If you like the 32K strings in CB-80, you are going to love CB68. It allows long strings--very long. CBASIC uses a one-byte length counter which allows strings to contain up to 255 characters. CB80 increased that to two bytes which allows almost 32K characters in a single string. Well, in the spirit of the horsepower race of the late '50's, CB68 uses a four-byte length counter. According to the manual, this means that a CB68 string variable is limited to a paltry 2,147,483,647 characters. That string will hold only a little over one million pages of average text, which if printed out would occupy around 350 feet of shelf space.

Integers have also been expanded to four bytes. This is a real advantage. They are stored as a 32-bit two's complement binary number. Value range is -2,148,483,648 to + 2,148,483,647. This allows much faster processing of many number intensive functions which require more than the four significant numbers allowed by 16-bit integers. With this range, we can discard the most significant 2, and use the remainder to represent any number between -999,999,999 and + 999,999,999. The discarded digit even allows us to test for overflow. This is a very useful range of values. It even allows for dollar accounting up to \$9,999,999.99 using integers. That range will not suffice for Digital Research's books, but it will do nicely for mine.

Real numbers are stored in the same 8-byte format as CB80 with fourteen significant digits.

CB68 is a software development tool designed and implemented to provide the professional with a method of developing business-oriented applications for the 68000 processor, or to transport existing CBASIC or CB-80/86 applications to this processor. It is in my opinion a successful effort in that direction. CB68 is not a casual compiler for a beginner to learn on. A beginner could soon master the language syntax, but would be totally intimidated by the linker.

CB68 will add a large number of machines to the market for the present vast library of CBASIC software. Digital Research has a large commitment to provide users of its software the best support and the widest base of hardware in the industry. CB68 is a welcome tool in our kit. 

## Book Review

# GETTING STARTED WITH CP/M

by Eugenie Dickerson

Good information together with a clear presentation make *Getting Started with CP/M* an excellent value, especially for the computer novice. The book might also serve as a convenient reference work on CP/M-80 2.2 for the more advanced user.

Authors Patten and Calandrino presume their audience has no experience with computers or knowledge of programming. They begin chapter one by drawing an analogy between CP/M and a bank teller. An operating system functions as a go-between, like the teller.

From there, the book instructs on floppy diskette tracks and sectors, disk care, loading, and general file name structure. Dozens of definitions gently appear, never seeming like a textbook. Sometimes

a term is used a paragraph or so ahead of its explanation, then again shortly after the definition. The reader's curiosity becomes aroused, satisfied, and reinforced--and the meaning sticks.

Chapter two comprises fifty-seven of the book's ninety-nine pages. Herein lies the meat. Following an overview of CP/M's internal structure, a detail-intensive tutorial presents line editing, built-in, and transient commands. The writers devote a large portion to PIP and STAT.

The sections on error messages could prove invaluable to the beginner. Fully and clearly written, the information is also headed and paragraphed for quick sighting and easy reference.

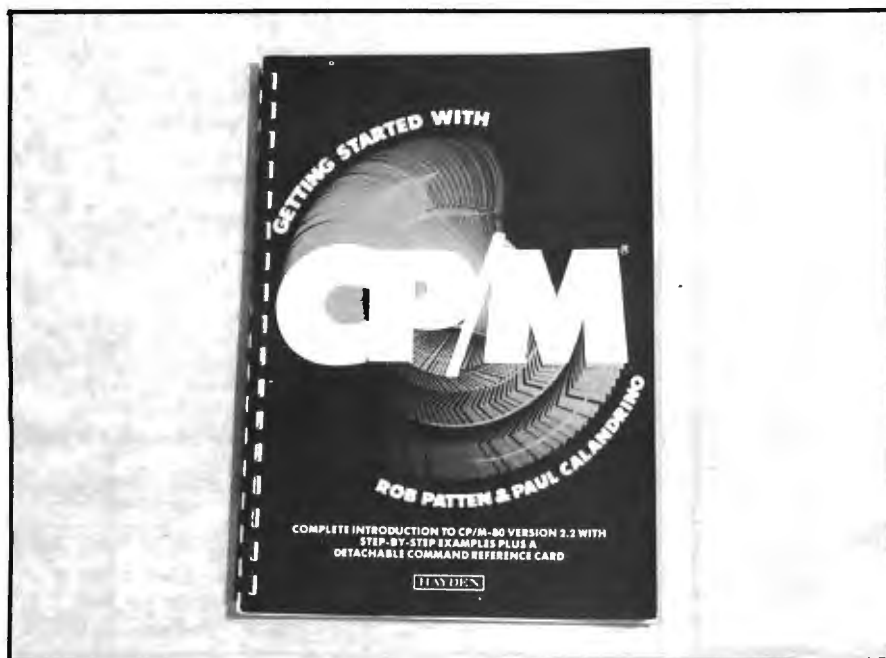
Patten and Calandrino remain true to their starter-level goal by limiting discussion of the relatively complex features of CP/M: ASM, DDT, LOAD, MOVCPM, SAVE, and XSUB. The authors refer the reader to other documents for in-depth study of these utilities. Cross references to other material in the book appear frequently, at times interrupting the flow of discussion.

Chapter three takes the reader through booting CP/M, formatting a new disk, and duplicating an original CP/M end-user disk.

Next the authors provide a very light introduction to application programs with a suggestion to check with software vendors for deeper and more specific information. This advice might better have come after chapter five, which draws the reader, one half-step at a time, into the ED utility. After experiencing the

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by Rob Patten and Paul Calandrino  
Hayden Book Company, Inc.  
Rochelle Park, New Jersey 1983  
99 pages, \$12.95





limitations of ED, the reader may be more receptive to consideration of application programs.

Three excellent appendixes cap the book. In Appendix A commands are listed alphabetically and in large print, followed by their type, function, and page reference number. The Glossary, Appendix B, serves the beginning user well in clarity and completeness. Certainly the reader will keep an extra bookmark in this section. The last appendix sends the reader to several Digital Research publications and four other tutorials for more information.

Throughout the work drawings support the instructions. Most figures simulate screen displays, but a few show disk tracks and charts. The general layout of the book rates high: it's well organized, easy on the eyes, and helpful for locating quick information. The index is large and in keeping with the straightforward manner of the book.

The last page inside of the back cover is a tear-out CP/M Command Reference Card for the novice to keep beside the machine. The ED commands may be useful, but other

items will become unnecessary within the first five minutes of computer activity. For how long do we need a reference card to remember what <cr> means?

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## *an excellent value, especially for the computer novice*

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Patten and Calandrino provide a number of examples of commands and functions. Still, considering the elementary nature of the book, more and a greater variety of examples might have been helpful.


In a few instances a bright passage or touch of humor enlivens the instruction, but the writing never becomes flashy or more important than the factual material.

The writing is very clear, sometimes excessively so. Now and then I was told what I was about to be told. For instance, the pull-out

command reference card begins, "The following symbols are used on this card."

Regrettably, the preface gets the book off to a shaky start. It's weak and flabby, and unfortunately may discourage some readers from continuing with this otherwise fine work. The very first sentence offers one definition of CP/M, followed by two alternates. Take your pick. A stronger opening would have assured the reader more on the knowledge of the authors.

Also included in the preface is a "Guide to the Contents of This Book," which is little more than a repetition of the table of contents. Two paragraphs later we are given a display drawing and told that user input will appear in these drawings in boldface. They don't—in displays anywhere in the book. A couple of typographical errors contribute further confusion.

*Getting Started with CP/M* makes no attempt to teach programming. Though limited in scope, it accomplishes very well what the authors set out to do and makes worthwhile reading for the beginner in CP/M. 



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## PART 1

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SIG/M Vol 145 VFILER - A SCREEN ORIENTED FILE MANIPULATION UTILITY  
by Richard Conn

index	name	size	crc	description
145.01BISHOW-2.A86	9K	7A EB		Bidirectional show - a paging program
145.02BISHOW-2.ASM	10K	0E 1D		in both CP/M 80 and CP/M 86
145.03BISHOW-2.CMD	2K	C6 40	/	
145.04BISHOW-2.COM	1K	DC D8	/	
145.05SAVEMUNY.DOC	2K	C0 3C		Tips on adapting Heath programs
145.06SD-488 .ASM	66K	B4 03		SD with HELP and WordStar fix
145.07SD-488 .COM	4K	CD 14	/	
145.08SD1 .A86	16K	2F 5C		SD for CP/M 86 with technical adjustments
145.09SD1 .CMD	3K	43 70	/	
145.10VFILER .ASM	84K	C8 AE		A screen oriented file manipulation
145.11VFILER .DOC	2K	EA 81		utility adjusted for your terminal.
145.12VFILER8 .COM	8K	93 88		Move arrow through directory for action.
145.13VFILER8C.ASM	3K	F6 07		Integrates with ZCPR2 or stands alone.
145.14VFILER2 .COM	8K	5B 1D	/	

SIG/M Volume 144 Miscellaneous Programs  
Software Tools of Australia and others

144.01GRAPH .REL	1K	49 C2		Graph subroutines for Epson MX80
144.02GRAPH .ZOO	11K	12 04	/	
144.0312 .CGM	22K	4D A4		Intel to Zilog mnemonic source
144.0412 .DOC	11K	92 EA		code translator
144.0512 .DOT	7K	C1 83	/	
144.0712 .PDS	14K	2A 9C	/	
144.07MAKEFILE.ASM	6K	B6 39		Builds a dummy file with marked blocks
144.08MAKEFILE.COM	2K	FD 0E	/	
144.09NESTING .C	1K	10 C6		Notes on nesting in BDS C from version

144.10NESTING .NOT	3K	AD F7	1.45a	
144.11PMDLALDS.FRG	13K	B9 52		Autodialing with PMM1
144.12RENAME .C	8K	A2 FF		Wildcard rename utility
144.13RENAME .DOC	4K	0F 96	/	
144.14RENAME .OBJ	10K	A0 8B	/	
144.15BDOS .H	1K	81 07	/	
144.16SETBOOT .MAC	19K	6B B7		Osborne 1 boot
144.17SQ .CQ	8K	AC 51		Update to squeeze, wildcards and other
144.18SQ .H	2K	10 97		features
144.19SQ .OBJ	17K	66 FE	/	
144.20SQ15A .DOC	2K	29 77	/	
144.21SQ15A .SUB	1K	37 E4	/	
144.22SQCOM .H	1K	3E 8E	/	
144.2310 .C	1K	75 6A	/	
144.24 LONG .CQ	2K	66 0B	/	
144.25TR1 .CQ	2K	10 74	/	
144.26TR2 .CQ	9K	8F 25	/	
144.27UCSD2CPM.C	16K	B4 5A		Text transfer UCSD formatted disk to CP/M
144.28UCSD1R .C	10K	EF E4		List directory of UCSD Pascal disk
144.29UCSDTYPE.C	15K	A0 5C		Text transfer UCSD dir to CP/M console

SIG/M Volume 143 Packet Radio, Printer Utilities, etc  
Software Tools of Australia (extracts)

143.01ATTEN .BAS	3K	74 9F		Electronic attenuator design utility
143.02DEPREC .BAS	3K	EC 45		Depreciation schedulit
143.03GENINDEX.OBJ	20K	09 A0		Generates index for WordStar text file
143.04GENINDEX.PAS	12K	F0 96	/	
143.05INDEX .PAS	1K	12 D6	/	
143.06INDEX101.DOC	5K	67 05		WordStar indexing utility
143.07INDEX101.OBJ	11K	41 14	/	
143.08LPR .C	9K	F0 E8		Print program for MX80, wildcard names
143.09LPR .OBJ	14K	B6 16		& clock
143.10DGPT .PDS	7K	FE 08		Packet Radio Software for CP/M Systems
143.11PACKET .ASM	25K	98 C9	/	
143.12PACKET .DOC	6K	05 2A	/	
143.13PACKET .RPT	12K	3A 64	/	
143.14PACKET-0.DOC	3K	A2 CC	/	
143.15PACKET2 .TXT	14K	0D 18	/	
143.16PACKETCF.TGT	15K	BA 6D	/	
143.17PRINTER .INF	2K	91 2B		Control codes for EPSON MX80 printer
143.18DRPUN .MAC	1K	13 85		FORTTRAN routine to access CP/M RDR and PUN
143.19RESXIOS .ASM	13K	F1 9E		Example of HP/M 2 Resident XIOS
143.20SETMX .ASM	4K	9B BA		Epson MX80 printer setup utility
143.21SETMX .DOC	2K	D3 3B	/	
143.22SETOK .ASM	6K	7E C4		Okidata printer setup utility
143.23SETOK .DOC	2K	01 10	/	
143.24VIDEO .INF	3K	34 D9		Video terminal codes
143.25VIDEOENW.INF	13K	D1 C6	/	

SIG/M Volume 142 Games from Software Tools of Australia  
Extracted from recent releases

142.01ALMAZAR .BAS	2K	C2 29		Adventure game from Micro-80
142.02ALMAZAR .DOC	2K	0F D5	/	
142.03SFA/SAV .O	1K	AF A4	/	
142.04SFALDES .O	9K	1E 34	/	
142.05SFALDES .BAS	7K	01 C9	/	
142.06SFAMAIN .BAS	15K	53 04	/	

142.07SFAMOVE .0	2K	53	F7	/
142.08SFAMOVE .BAS	2K	15	3F	/
142.09SFABDES .0	2K	02	30	/
142.10SFABDES .BAS	2K	18	7A	/
142.11SFARESP .0	13K	FE	3E	/
142.12SFARESP .BAS	5K	17	7A	/
142.13SFAVOC .0	1K	DC	8C	/
142.14SFAVOC .BAS	1K	9A	37	/
142.15AUSOPOLY .BAS	28K	57	26	English/Australian of CPMUG game
142.16BACARRAT .BAS	4K	F4	49	Osborne MBASIC game
142.17BANNER .Z80	19K	70	61	Prints banner to console & printer
142.18BLAKJACK .BAS	12K	87	37	Osborne MBASIC game
142.19FDGASH .ASM	1K	50	05	Calculates number of years of schooling
142.20F06INDEX .PL1	3K	33	A4	required to read a document
142.21GOLDMINE .BAS	8K	65	27	MBASIC game
142.22KPRO2-SM .BAS	10K	28	F7	Spacewar game for Kaypro 2, MBASIC
142.23MAKEADV .BBS	6K	58	93	Make your own Adventure
142.24SAMPADV .ADV	8K	05	A0	/
142.25SAMPADV .MOC	9K	E8	3C	/
142.26OZDOT .BAS	8K	E2	08	Osborne version of DOTS
142.27PACHAN .ASM	4K	2C	C4	PACHAN game for cursor addressable
142.28PACHAN .DAT	4K	34	64	terminals
142.29PACHAN .OBJ	16K	86	A2	/
142.30SPACEMAR .BAS	11K	FB	00	Osborne MBASIC game
142.31YKW1 .BAS	2K	E4	68	"My other computer is an IBM" for Osborne
142.32YKW2 .BAS	2K	74	5F	"My other computer is an IBM" for ADM-31

SIG/M Volume 141 Kaypro, Osborne & Big Board Programs  
Software Tools of Australia Extracts

141.01BDRIVER.Z80	44K	03	55	IOS driver for Ferguson Big Board SBC
141.02BMODS .DOC	7K	32	F0	Double Density and other mods for Big Board
141.03BBSYSTEM.Z80	42K	9F	87	Modified monitor ROM for Big Board
141.04BBSYSTST.ASM	2K	F7	2F	Background memory test, Lifelines May 1981
141.05D1SPPRM.8B	6K	31	AC	Big Board Character Generator ROM contents
141.06KAYMODEN.DOC	1K	B1	62	SHODEN37 set up for Kaypro 2

141.07KAYMODEN.OBJ	11K	80	A0	/
141.08KPRMODM7.DOC	2K	04	8E	Documentation on MODEN7 for Kaypro 2
141.09KPROTERM.TXT	2K	90	26	Information on Kaypro 2 terminal control
141.10MOD7658B.ASM	64K	BD	A9	MODEN765 for Big Board
141.11MOD7658B.OBJ	10K	02	1A	/
141.12OSBDUMB .DOC	2K	18	04	Dumb terminal program for Osborne 1
141.13OSBDUMB .MAC	10K	D3	20	/
141.14OSBDUMB .OBJ	2K	54	C2	/
141.15OSBM800T.ASM	8K	34	35	MB00T31A for Osborne 1
141.16OSBM800T.DOC	1K	15	D8	/
141.17OSBORNE .Z80	1K	1A	AD	Pip patch for Osborne 1
141.18OSD .DOC	2K	4F	F3	Sort directory program (SD-42) for
141.19OSD .OBJ	2K	E6	0C	Osborne 1
141.20OSTRICKS.DOC	6K	E9	5B	Various hints on Osborne 1 USART

SIG/M Volume 140 Cross Assemblers and Misc. Utilities  
Software Tools of Australia Extracts

140.0168KASM .FOR	42K	84	DD	68000 Cross assembler from Dr. Dobbs
140.0268KASM .MOC	7K	95	3F	/
140.03CPU .ASM	4K	7E	09	Faster 808C for 8085
140.04SPEEDUP .C	7K	02	47	/
140.05ERROR .FOR	2K	D1	1A	Fortran-80 command switches & error codes
140.06EXORCOPY.C	12K	AE	A5	MOTOROLA mds to CP/M data exchange utility
140.07FILENAME.FOR	2K	50	6A	Fortran filename parser (German comments)
140.08M6805 .LIB	8K	55	29	Macro Lib. of MOTOROLA MC6805 opcodes
140.09REMAKE .PL1	5K	5A	67	Compiler manager
140.10PCODES .	2K	28	F0	MOTOROLA 6800 cross assembler
140.11EXBUG3 .SYM	1K	7A	56	/
140.11SEG1X68 .C	17K	1B	E7	/
140.12SEG1X68 .OVL	6K	B8	83	/
140.13SEG2X68 .C	10K	58	68	/
140.14SEG2X68 .OVL	5K	73	4A	/
140.17X68 .C2	17K	C4	12	/
140.18X68 .H	5K	59	84	/
140.19X68 .OBJ	15K	1C	B6	/

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140.155IMLT	.FOR	8K	6D	E9	Solves simultaneous equations in fortran
140.20XTCPM141	.ASM	26K	A7	DA	Method to extend CP/M 2.2 system
140.21XTCPM141	.DOC	2K	A9	OE	/
140.22280DISK	.DOC	4K	5E	OB	Z80 Disk diagnostic, Dr. Dobbs April 1981
140.23280DISK	.MAC	23K	BF	13	/
140.24280DISK	.OBJ	3K	03	12	/

**SIG/M Volume 139 MODEM UPDATE - MODEM 712**

139.01MDM712	.IOF	4K	C1	FC	Latest version of MDM7xx
139.02MDM712	.LBR	204K	20	6D	/
139.03MDM712	.TXT	3K	9C	54	/
139.04MDM712	.UOD	4K	C8	D0	/
139.05UN	.COM	5K	6B	74	Recovers Basic-80 programs
139.06UN-PROT	.BAS	2K	91	35	Fix for Apple for UN.COM

**SIG/M Volume 138 BUILDING ENERGY DESIGN ANALYSIS  
-California Energy Commission  
Volume 2 of 2**

138.01CZ	.LBR	174K	DA	E8	Weather data for vol 137
138.02MP-DEMO	.LBR	34K	70	A4	demo program - set for Drive B

**SIG/M Volume 137 BUILDING ENERGY DESIGN ANALYSIS  
-California Energy Commission  
Volume 1 of 2**

137.01MP	.COM	9K	05	D8	MICROPAS 1.0 - A Microcomputer
137.02MP-CNTRL	.SYS	1K	A9	0A	Program for Building Design
137.03MP-EDIT	.COM	18K	01	4B	Analysis. Can estimate the
137.04MP-FORM	.COM	10K	FE	4F	performance of conventional
137.05MP-GRAPH	.COM	9K	FE	25	residential buildings as well
137.06MP-GRAPH	.SIM	1K	75	89	as buildings incorporating
137.07MP-INPUT	.COM	16K	77	56	passive solar and natural
137.08MP-INPUT	.DE1	1K	6C	9E	cooling features. Simulates
137.09MP-INPUT	.DE2	1K	D5	E6	a full year in 20 minutes.
137.10MP-INPUT	.DE3	1K	E4	1F	Requires MICROSOFT BRUN.COM.
137.11MP-INPUT	.DE4	2K	60	4D	
137.12MP-INPUT	.DE5	1K	3F	D1	
137.13MP-INPUT	.DE6	1K	3C	3B	
137.14MP-INPUT	.DE7	1K	AF	45	
137.15MP-INPUT	.DE8	1K	D1	1C	
137.16MP-INPUT	.ED1	3K	94	7B	
137.17MP-INPUT	.ED2	1K	62	22	
137.18MP-INPUT	.ED3	1K	41	7B	
137.19MP-INPUT	.ED4	3K	E5	15	
137.20MP-INPUT	.ED5	1K	B9	9F	
137.21MP-INPUT	.ED6	1K	2B	36	
137.22MP-INPUT	.ED7	4K	C2	AD	
137.23MP-INPUT	.ED8	1K	6A	C2	
137.24MP-INSTL	.DE1	1K	DA	0B	
137.25MP-INSTL	.ED1	4K	F0	A2	
137.26MP-INSTL	.SYS	1K	00	A3	
137.27MP-MENU	.COM	15K	F9	A0	
137.28MP-OPTIM	.COM	17K	CA	8C	
137.29MP-OPTIM	.INP	1K	C6	61	
137.30MP-OUTP	.S11	1K	F8	B9	
137.31MP-OUTP	.S12	2K	79	64	
137.32MP-OUTP	.S13	4K	B0	D4	
137.33MP-SIMUL	.COM	20K	4A	B8	
137.34MP-SIMUL	.IN1	2K	26	2F	
137.35MP-SIMUL	.IN2	8K	00	00	
137.36MP-SUNRY	.COM	16K	4C	22	
137.37MP-TABLE	.COM	17K	64	D2	
137.38MP-WEATH	.COM	18K	47	71	
137.39MP-WEATH	.INP	1K	B9	87	
137.40MP-INTRO	.DOC	5K	5C	C6	

**SIG/M Volume 136 BIG-BOARD utilities, modem patches, LISP doc.  
Software Tools of Australia Vol 18, etc.**

136.01BB-VIDEO	.MOD	1K	2E	B4	Video mod. for BIG-BOARD
136.02BBSCAN	.ASM	7K	6B	64	Disk integrity verifier for BIG-BOARD
136.03BBSCAN	.DOC	4K	9B	F9	/
136.04B16BDFMT	.ASM	7K	E0	A1	Disk formatting program for BIG-BOARD
136.05B16BDFMT	.DOC	1K	3D	CC	/
136.06B16BDFMT	.OBJ	1K	56	1F	/
136.07DATMODH	.ASM	29K	25	39	MODEM7A configured for DATAMAX

136.08 FFC	.ASM	12K	DF	9A	Bill Earnest's FAST copy for BIG-BOARD
136.09INDEX	.YAZ	2K	D6	D4	Yam disk index
136.10LIFSCORE	.BAS	17K	EC	03	How long to go
136.11LISP	.WPM	3K	96	90	Documentation for LISP interpreter, 8080
136.12MOD48B1A	.OBJ	4K	A2	31	MODEM4 configured for BIG-BOARD
136.13MODEMH	.DOC	5K	10	32	/
136.1402DEM	.ASM	4K	3F	E4	MODEM7 patch for OSBORNE 1
136.15PATCH	.YAM	2K	29	80	YAM patch to disable system file access
136.16REMOTE	.DOC	3K	A7	0C	Construct. details for remote SORCERER keybd
136.17SORMODH	.ASM	29K	5B	3C	MODEM7 configured for SORCERER
136.18TRANSLAT	.DOC	2K	59	41	BIG-BOARD Keyboard translation
136.19TRANSLAT	.Z80	5K	83	5B	/
136.20YAMB9	.CRL	1K	9B	7C	YAMB & YAM9 combined for BDS C v1.46
136.21YAMB9	.CSM	5K	2F	28	/
136.22YAMKAP	.OBJ	27K	E0	64	YAM modem program for KAYPRO II
136.23YAMOSB	.OBJ	25K	1E	64	YAM modem program for OSBORNE 1
136.24YAMSAN	.OBJ	25K	E2	CF	YAM modem program for SANYO MBC-1000

**SIG/M Volume 135 SOFTWARE TOOLS OF AUSTRALIA - VOL 17  
CP/M utilities and misc. programs**

135.010IR-DUMP	.ASM	8K	42	F2	Displays disk directory formatted
135.02DIR-DUMP	.DOC	2K	C9	83	for 64 col. screen
135.03DIR-DUMP	.OBJ	1K	E6	7A	/
135.04EXTCOM1	.ASM	5K	D8	24	Exit from CP/M to comms program (B251 UART)
135.05INF	.MAC	14K	AD	16	Comprehensive disk format display
135.06INF	.OBJ	2K	7E	A3	/
135.07ITOH5000	.ASM	8K	AC	EB	Graphics driver for C.Itoh 8010
135.08LD1	.C	8K	1F	9C	Loader for machine language programs
135.09LOCK	.DOC	2K	71	59	'Locks' program for security
135.10LOCK	.OBJ	11K	68	39	/
135.11LOCK	.WPF	11K	2F	F8	/
135.16WKEY	.OBJ	1K	BB	59	/
135.17WKEY	.WPF	5K	EB	67	/
135.32UNLOCK	.OBJ	11K	41	C1	/
135.33UNLOCK	.WPF	12K	8B	34	/
135.12LPR	.CQ	6K	2F	6F	Printer program - currently set for Epson
135.13LPR	.OBJ	14K	B6	16	/
135.14MFT50	.ASM	27K	B9	CE	Multiple file transfer program
135.15MFT50	.OBJ	3K	97	82	/
135.18PCAT	.BAS	6K	1C	42	Hardcopy catalog in master catalog system
135.19POKER	.BAS	12K	96	C6	Beats you every time
135.20RELOC	.CQ	6K	E2	59	Move a program to top of TPA and run it
135.21RELOC	.DOC	19K	12	6F	/

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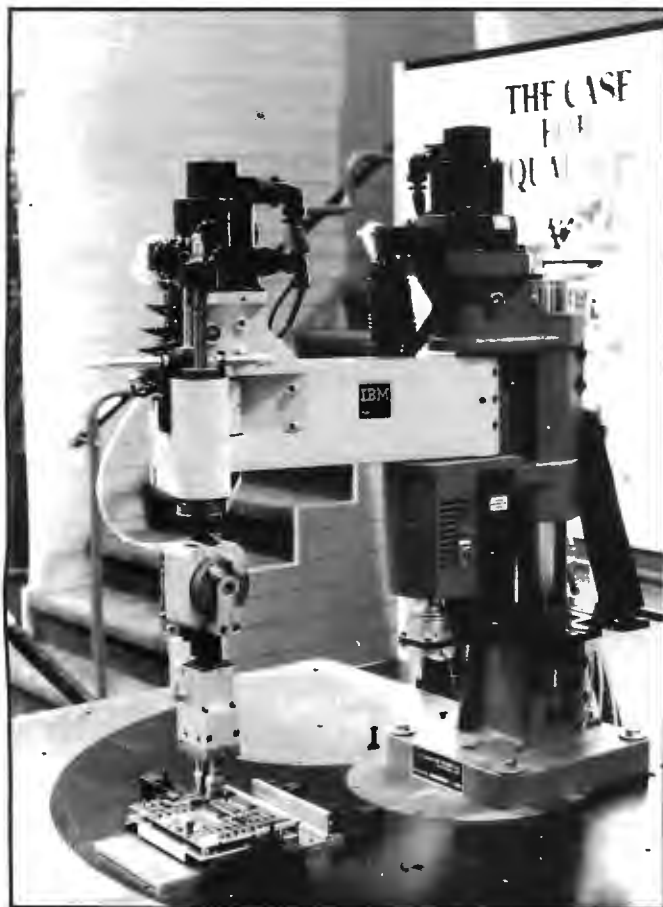


story by Len Horton  
and Errol Smith

photos by  
Jeffrey S. Griffin



## A DAY AT THE ZOO



## ROBOTICS



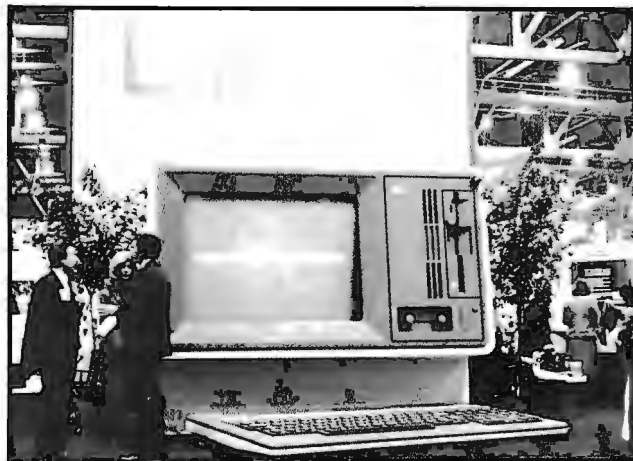
**CROWDS**

**EXCITEMENT**



**MAGIC**

**COMDEX**



**A** total of more than 83,000 people pushed, shoved, stumbled and fought their way into a computer show that has become too big for them to see or appreciate. Half blinded by lighting that makes Christmas decorations never necessary in Las Vegas and distracted by the large number of slot machines, Blackjack games and people who looked as if they just stepped out of a Star Wars bar, COMDEX attendees somehow managed to make time to see some of the show displays.

If they were after new products, they had more than they could comprehend. Especially if they were interested in the IBM PC. Clearly, COMDEX has become a show of new software and hardware for IBM PC and PC compatible computers. Before IBM entered the marketplace, Apple had much of the limelight to itself, but never as much as IBM now has.

Virtually all new software is being developed for the IBM PC, and new hardware is either "an IBM look alike," IBM compatible or, in some way, better than the IBM PC. This show marked the first time that PCjr went to COMDEX. It received more attention than any new product since the IBM PC. A remarkable accomplishment for a new computer that most experts believe is a disappointment for computer enthusiasts who were waiting for IBM's home computer.



The influence of the IBM PC on CP/M software development was clear. Most of the new CP/M packages will be developed after MS-DOS versions for the IBM PC. For example, OZ, Fox and Geller's new software program to help business executives manage their businesses, was announced for the IBM PC for \$495. OZ will spotlight revenue and cost variances, enabling management to react faster to problems.

Much of the other CP/M software was improved versions of existing packages. For example, MicroPro offered an extended cell

capability for an existing 16-bit system running CP/M-86 and, of course, MS-DOS and PC-DOS.

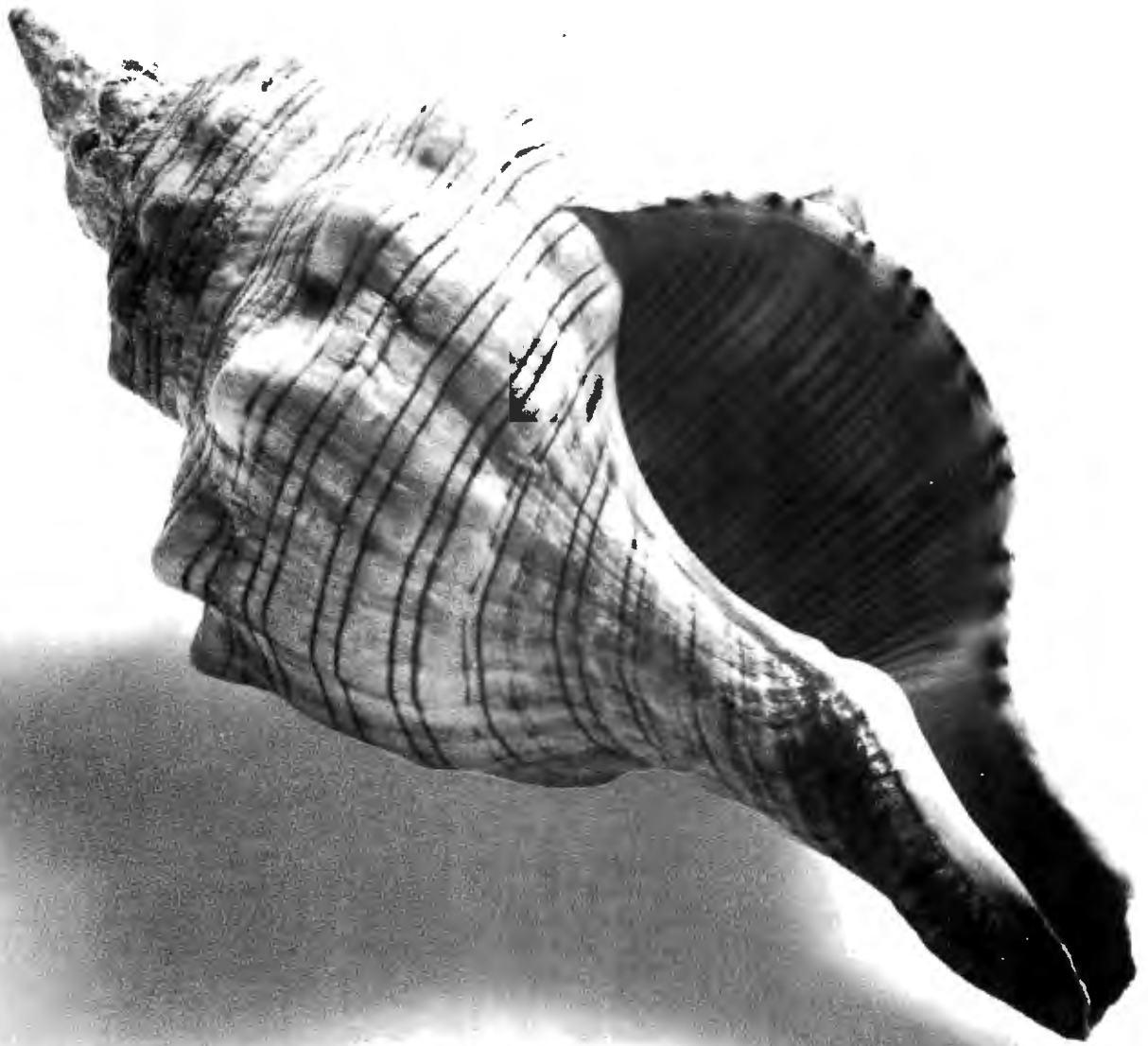
MicroPro did, however, offer an improved CP/M product for owners of Apple II, II+ and IIe computers. StarCard is a 6 MHz Z-80B processor with 64K RAM on a printed circuit board. Priced at \$695 when bundled with WordStar, new StarCard provides easier installation, user-definable function keys and expanded documentation.

MAG Software, Inc., of Canoga Park, California, introduced release 4.0 to permit any number of users to read and update files simultaneously without conflict or loss of performance. This new version is CP/M-80 and CP/M-86 compatible.

Gryphon Microproducts, of Silver Spring, Maryland, introduced a utility program for dBASE II programmers. Entitled The Array Program -- dB/RA, it offers dBASE II programmers the ability to expand the number of memory variables in their system from 63 to more than 65,000. With dB/RA, dBASE II can use up to 10 1-, 2- and 3-dimensional arrays of numeric, character and logical data. dB/RA is priced at \$200.

Interest in operating systems continues to grow, even beyond





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## COMDEX

MS-DOS and UNIX, both of which were widely discussed at COMDEX. Multi Solutions, Inc., of Lawrenceville, New Jersey, introduced its S1 operating system. According to Charles Lombardo, S1 permits good portability between 8-, 16- and 32-bit microcomputer systems. He also claims that S1 can read and write CP/M files as well as a number of other file types, including MS-DOS and UNIX.

If CP/M software introduction hardly set new records, there were some exciting new CP/M-based computer systems introduced. Morrow showed its MD3 portable computer system that includes 64K RAM; two double-sided, double-density, 5.25-inch floppy disk drives (400KB each); a 5" X 9" monitor with 24-line by 80-character display; two ports (one serial and one parallel); a detachable keyboard with more than 30 programmable function keys; and character-type graphics.

Bundled with the system are seven software packages including CP/M 2.2, Microsoft BASIC 80, word processing, spreadsheet, spelling checker, Personal PEARL database manager and Quest Bookkeeping System. Price is \$1,899.

Teleram Communications Corporation, of White Plains, New Jersey, announced two new, light-



weight portables that use CP/M-80 and CP/M-86. The T-4000, which sells for \$1995, and the T-5000, priced at \$2,495, fit into briefcases and include 64KB RAM, 4KB ROM and provide 128KB or 256KB of bubble memory.

Home computer enthusiasts now have another system to consider. The LASER 200, by Video Technology, of Elk Grove Village, Illinois, features a Z80A CPU and as many as 45 software cassettes including educational, entertainment, business and home management packages. Expandable to 64KB RAM, LASER 100 will be

priced at retail for less than \$100.

An Apple-compatible computer designed for use in vehicles, boats and aircraft was introduced by Wholesale Technology, Inc., of Anaheim, California. Named the Wildcat, it provides the ability to run CP/M 2.2 and Apple II software. With an aluminum carrying case, it offers Z80 and 6502 dual microprocessors and 64KB RAM. With one disk drive, 24 function keys and color graphics (280H X 160V at the max), it is priced at \$1099.

Many of the new computers are being called workstations. Digital Microsystems, of Oakland, California, introduced its DM-816 workstation that is compatible with the IBM-PC and permits the user to run either MS-DOS or CP/M. It includes 8088 and Z80A processors, 256KB RAM that can be expanded to 512KB. Its price is \$1695.

Some of these workstations are said to be "supercharged." The Series 8000 Turbo-Micro, from Advanced Computer Technology, of San Diego, California, a multi-user, multi-processor system that is designed to go head to head against better known multi-processor/multi-user systems such as from Datavue Corporation of Norcross, Georgia.

The Mentor 1000 is also a workstation that is compatible with both CP/M and MS-DOS. Introduced at COMDEX by Applied



Digital Data Systems, Inc., of Hauppauge, New York, Mentor 1000 uses 8086 and Z80A processors, dual 800KB disk drives and bundled software including word processing, spreadsheet, database management and graphics for \$3395.

Judging from the reaction of hundreds of show attendees, one of the most useful products might just be Bit Banger, a novelty item produced by Bits & P.C.'s of San Francisco. It is a foam-headed mallet frustrated computer users -- and certainly frustrated and tired COMDEX show attendees -- can use to relieve their frustrations. Better than an executive touchstone, Bit Banger could become one of the most useful new products introduced at COMDEX this year.



#### Perfect Link Specifications

##### Wireless disk file transfer (IBM computer reads and writes diskettes from other computers)

- Disk formats supported
  - Epson QX-10
  - Kaypro II
  - IBM PC CP/M 86 Single Density
  - IBM PC CP/M 86 Double Density
  - Osborne I Double Density
  - Zenith Z-90 737
  - Any PC-compatible MS DDS format disk

##### Automatic dialing and log-on

- 10 programmable system definitions
  - all relevant parameters, including phone number, identification number, auto log-on sequence, communications settings
- 20 programmable keys per system (200 total, up to 80 characters each)
  - pause specified seconds (up to 80)
  - issue break sequence
  - wait for specified response

##### Automatic set-up for major information and communication services

- CompuServe
- Dow Jones
- Knowledge Index
- NewsNet
- Official Airlines Guide
- The Source
- EasyLink
- MCI Mail

##### Communications settings

- XMODEM protocol file transfer
- XON/XOFF support during file send/receive
- Full-duplex, half-duplex options
- "Host" option
- Use carrier option
- RTS/CTS protocol (Request to Send/Clear to Send)
- Tab to space conversion (upon receiving)
- 110-9600 baud support
- Multiple file transmission
- Echo to screen of transmitted file (send without error checking)
- Optional add/delete of linefeeds

##### Sending and receiving files

- Non-ASCII (binary) file transmission
- Send/receive with/without name options

##### Terminal Emulation

- TTY ("Dumb") terminal
- Televideo 920
- VT-52
- ADM-3a
- IBM 3101
- Teletype

##### Utilities

- On-line viewing of disk directories
- Deletion and renaming of disk files
- Printer on/off toggle
- Modem/telephone hangup
- Transmission of true break signal
- Auto exec key (allows auto dialing upon loading of system)
- Automatic log-off key

##### Clock Display

- Elapsed time of transmission
- Continuous connect time
- Estimated transmission time of file to be sent

##### Computers supported (minimum 128K RAM)

- IBM PC, XT
- Columbia MPC, VP

##### Modem options

- Hayes Smart 300 or 1200
- Robotics Smart 300 or 1200
- Novation Smart 300 or 1200
- Other Smart 300 or 1200 (definable auto-dial command)
- Novation J-Cat
- Lexicon Lex-11
- GDI 212a
- Any Bell 103 or 212a compatible modem
- Manual Dial 300 or 1200
- Multi-modem MT 212AH
- TNW Operator 103
- Rixon PC212A

## PERFECT SOFTWARE

The Perfect Software Corporation introduced a new telecommunications program to communicate with electronic mail systems, information services and other computers. Initially Perfect Link will only be available for IBM PC and compatible systems. The package has an automatic installation feature and is pre-configured to work with eight information and communication services including MCI Mail, Western Union Easy Link, Dow Jones Knowledge Index and The Source. An automatic dialing and logon capability allows the user to set the relevant parameters such that the logon process is accomplished with one button. Of course, Perfect Link is compatible with their Perfect Writer.

A wireless disk file transfer system allows IBM PC's and compatibles to read and write diskettes from computers using CP/M, CP/M 86 and MS/DOS. Also, it can transfer files via modem using the common X-modem protocol. A more comprehensive list of the capabilities is shown below. Perfect Software is in Berkeley, California, 415 527-2626. Circle No. 75



## DBSI ENHANCES THE DBS-16

The DBS-16 is a multi-processor, multi-tasking 16-bit super microcomputer. It will support up to 16 users with as many as seven Intel 80186 processors. It operates under MP/M-16 and DBSI's own DBS-NET for multi-processors. The basic module includes one 80186 in a desk-top cabinet and is capable of supporting up to four users with up to 512K RAM memory. An expansion chassis may be mounted under the desk-top unit that has positions for the six additional 80186 processor cards or standard Multi-bus cards in any combination. A fully configured DBS-16 will utilize 3.5MB of processor memory on a 50MBit bus, one of the fastest around. This system is particularly well suited for OEM and vertical applications due to its growth potential.

At COMDEX, DBSI announced a removeable 5MB Winchester Disk, added disk capacity and a 13MB streaming tape for back-up requirements. DBSI International is a subsidiary of Digilog based in Montgomeryville, Pennsylvania, phone 215-628-4810. Circle No. 67



## OLYMPIA 16-BIT PEOPLE COMPUTER

The new Olympia People 16-bit professional microcomputer made its debut at COMDEX. Targeted for corporate executives, small business owners and professionals, People will operate under CP/M 86, Concurrent CP/M or MS/DOS. Olympia has been in the office equipment business for over 75 years so the support should be there. People's CPU comes standard with 128KB RAM which can be expanded to 512KB, and includes two floppy drives with 1.3MB storage capacity each. A parallel printer port and RS232 port are standard and IEEE interfaces may be added as options. Also standard are a 12-inch green non-glare CRT and a 91-key free-standing keyboard. Bit-map graphics are supported with 640 X 475 resolution. Other options include: a color monitor and controller with an eight-color palette and a 10MB Winchester drive. The U.S. retail price is \$3595. Olympia is a subsidiary of Olympia International of West Germany. The U.S. office is located in Somerville, New Jersey, phone 210-722-7000. Circle No. 68



## ITT INTRODUCES XTRA

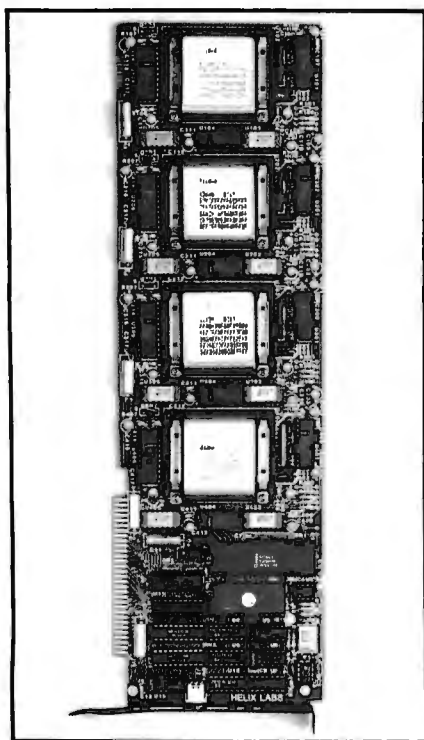
ITT Corporation has joined the long line of IBM PC compatible vendors. Their new XTRA will be marketed in the U.S. by ITT Courier Terminal Systems headquartered at Tempe, Arizona. Again, the new generation of computers is beautifully packaged with better video and smaller footprints on your desk. The CPU specifications as far as RAM and disk storage are the same as the PC, however, XTRA does have a serial and parallel port as standard. One very interesting thing is that ITT is going to provide financing for both the dealer and retail customer. Soon computer retailing is going to look like the automobile market, that is, the seller must take in trades and provide financing. ITT appears to be taking the service issue very seriously, there will be nationwide on-site service support through ITT



## COMDEX

field engineers; telephone application support via an 800 number; a 90-day warranty; ITT regional service centers and a user self-maintenance program. They are also setting up a user training program using video cassette programs. ITT Courier's phone number in Tempe, Arizona, is 602-894-7000.

Circle No. 11



### THE HELIX PC BUBBLE DISK

Helix Laboratories, Inc., introduced the PC Bubble Disk, a half-megabyte memory expansion board. The board is designed to emulate a Winchester in the IBM Personal Computer. The Bubble Disk responds to fixed disk commands under most operating systems found on the PC including CP/M, Pascal, and PC-DOS. The Bubble Disk can also boot any of the above operating systems. The board contains four Intel 7110-4 one-megabit memories providing a non-volatile mass memory with no moving parts. Performance is good with an average access time of 48 msec and a transfer rate 400 kbits per second. It would seem that one of the better applications for this device would be in the portables. The price is \$1495. Helix Laboratories is in San Diego, 619-451-0270. Circle No. 12



### THE STM PERSONAL COMPUTER

STM announced at COMDEX its new STM PERSONAL COMPUTER. STM is the U.S. supplier of the Pied Piper computer and its new computer bears some resemblance. The STM PC comes standard with a 16 line by 84 character LCD display that even supports a 540 X 200 pixel graphics package. Except for GRID systems, this is the best LCD display to date. The panel is backlit by an electroluminescent panel so its brightness is not dependent on ambient lighting, in fact it would work in a dark room. Also there is an expanded display capability for standard video monitors which supports 25 X 80 or 25 X 132 character formats. In the expanded display the graphics resolution is 640 X 400 pixels. The STM PC features 256KB RAM expandable to

512KB and has dual 1MB floppy disk drives for a total of 1.6MB formatted storage. This is probably the largest floppy storage of any portable computer. The STM PC also includes a built-in, auto-dial, auto-answer, 300/1200 baud modem. There is communications software included for ease of use with information services and file transfer. The product is driven by an Intel 80186. A built-in 40 column thermal printer has graphics screen dump capability. Bundled software includes wordprocessing, a spreadsheet and a filer package. The unit weighs only 17 pounds and is quite compact, however, it doesn't have batteries and requires standard AC power. The STM PC seems like an excellent buy at under \$3000. Shipments will begin in April, 1984. STM Electronics is based in Menlo Park, California, telephone 415-326-6226. Circle No. 13



## XEROX 1800 PORTABLE COMPUTER

The XEROX COMDEX exhibit featured their new 1800 line of portable computers designed for executives who travel. The line includes the 1810 which has an 8-bit CPU and CP/M. The 1810 has 64KB of RAM and a LCD screen. It weighs only 5 pounds and will fit in a briefcase. This includes a rechargeable battery pack that will operate the computer for up to 10 hours. Standard features include an appointment calendar, alarm clock, four-function calculator, tape recorder, electronic mail capabilities and Microsoft BASIC. The XEROX 1850 flat pack, an 8- and 16-bit processor with CP/M and MS-DOS upgrades the 1810 to a dual processor system. In addition, the 1850 features a built-in modem and serial and parallel ports. Although designed for office use, the 1850 is transportable. It can be expanded from 128KB to 512KB RAM.

The 1800 line is being marketed through the XEROX retail stores, further information can also be acquired through their Wellesley, Massachusetts, office at 617-237-3220. Circle No. 14



## COMDEX



### CHAMPION SOFTWARE CORPORATION

Champion Software, formerly Data Base Research Corporation, announced that it is demonstrating their popular 8-bit CP/M program, the Champion Business Accounting System on 16-bit systems. It will run under CP/M-86, MS/DOS and PC/DOS. The program is written in dBASE II and comes with a special 16-bit run-time version of dBASE II.

The software is noted for its features such as: automatic recovery, a comprehensive "HELP" function, performance and ease of use. Champion Software is in Lakewood, Colorado, 303 987-2588.

Circle No. 15

### BUSINESS SOFTWARE LIMITED

Business Software Ltd. is an Australian firm that is introducing two new products to the U.S. marketplace. PLANFIN is a forecast and budget program and PROFIN is a financial analysis program. Both are menu driven and easy to use. The programs are available through Softeam, Lifeboat and Westico. Demonstrations of the programs capability will soon be available through a network of over 350 dealers across the nation. Business Software can be contacted in Los Angeles, 213-410-3912.

Circle No. 16



## TG PRODUCTS ANNOUNCES MODEMS

TG Products, a manufacturer of video game equipment, has entered the communications market with a couple of very interesting products. We would have to call the ICI-1200 a "very" intelligent modem. It offers: 300/1200 baud rates, auto-dial, auto-answer, auto-redial, built-in 6502 microprocessor, buffer memory, non-volatile phone number directory and a real-time clock and calendar that lets you program calls at pre-selected times. In addition to all that, there is a printer port and spooler that lets you print files while processing other jobs. The 6502 processor will even let you send and receive files without being connected

to your computer. All of the common communications attributes are supported: half or full duplex, 103, 212a, CITT, and V.21. The ICI-1200 performs an auto self-test every time it is powered up and the audio monitor has a volume control. It sells for less than \$600.

TG is definitely setting a new standard in modem features, it sounds more like an entire computer system.

The other new modem, the TGM-300 is an inexpensive auto-answer auto-dial modem with automatic self-test. It sells for less than \$100 and there are versions that plug directly into the Commodore and Atari computers. TG can be contacted in Plano, Texas, at 214-424-8568. Circle No. 18



## FURNITURE, FURNITURE AND MORE FURNITURE

It was evident at COMDEX that the information revolution is broadening. There were at least 70, yes seventy, furniture exhibits. They range from inexpensive and functional to elegant, designer systems made from the finest of materials. It looks as if quite a few people are spending as much on their furniture and accessories as they are on their computers. One of the more interesting pieces is the new ergonomic chair. It has no back and the seat slants forward with a large share of your weight on a padded kneerest. I've been told by our typesetters that spend their day in front of a CRT that the chairs really work - no more back aches and burning sensations after a few hours.

Some of the new office furniture products (chairs, shelves, desks, etc.) are very clever, but it's pretty far afield from CP/M and computer technology, so we won't go into more details. However, if you care to do some research into office furniture, we have compiled a list of names, addresses and phone numbers. We would be glad to mail it to you if you send a self-addressed, stamped envelope to our business office. Circle No. 19



# COMDEX

## THE GIGADISC

Thompson-CSF Communications has introduced a laser disk subsystem that can store a billion bytes of information. In fact, all of the operating characteristics and statistics are rather amazing. Like the bubble memory -- we have been waiting for practical, cost-effective devices for years, at last it has arrived. Some of its characteristics: it can be recorded only once, the disks are removable, it is physically small - about 10 inches high and 19 inches square, a ten year storage life, the platters are inexpensive, the recording surface is protected by a transparent coating so the media is tough, no special environment required and one controller can handle up to 8 drives. The disk is organized like a magnetic disk into tracks and sectors, however, the track is a continuous spiral which allows continuous stream reading and writing. Each sector can be

### GIGADISC SPECIFICATIONS (Model GD 1001)

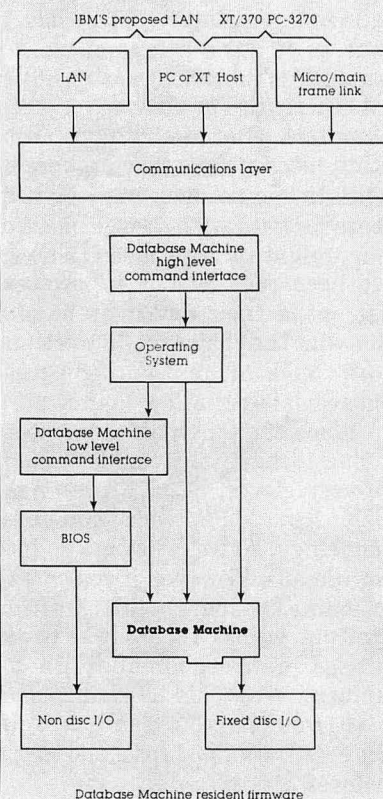
1. THE READ-WRITE UNIT		2. THE STORAGE MEDIA	
TECHNOLOGY	Solid state diode laser	TECHNOLOGY	Thermal alteration of a film encapsulated within the disk
INTERFACE	SCSI (Small Computer System Interface)	SIZE	· diameter 12" (305 mm) · weight (with its cassette) 1,300 g
PACKAGING	· two models are available: · 19" rack mount/4U (RETMA standards) · stand-alone · front loading disk (within a cassette)	FORMAT	· recording sides 1 or 2 · tracks/side 40,000 · sectors/track 25
ACCESS TIME	· within a band (40 tracks) 3 ms (typical) · beyond the current band 100 ms · average latency 25 ms	USERS'S AVAILABLE CAPACITY	· per sector 1 KB · per track 25 KB · per band (40 tracks) 1 MB · per side 1 GB · per disk (double sided) 2 GB
TRANSFER RATE	· to / from disk 4.1 Mbits/s · at the SCSI interface 8 Mbits/s	LIFE TIME	· before recording 5 years · after recording > 10 years · plastic copies > 10 years · metallic copies unlimited
RELIABILITY	· error rate (after correction) 10 <sup>-12</sup> · MTBF 10,000 hours · MTTR 30 mn	ENVIRONMENT	· operating + 10°C to + 43°C · storage - 10°C to + 49°C
POWER CONSUMPTION	250 W (max.)		
ENVIRONMENT	· operating + 10°C + 43°C		

All specifications subject to change without notice.

directly accessed with about 100 millisecond seek and latency time. The GIGADISC sounds like the perfect archival device if you have a

massive data storage requirement. Thompson-CSF has a New York office, 914-694-4450. Circle No. 20

## Operational Systems Flow Diagram

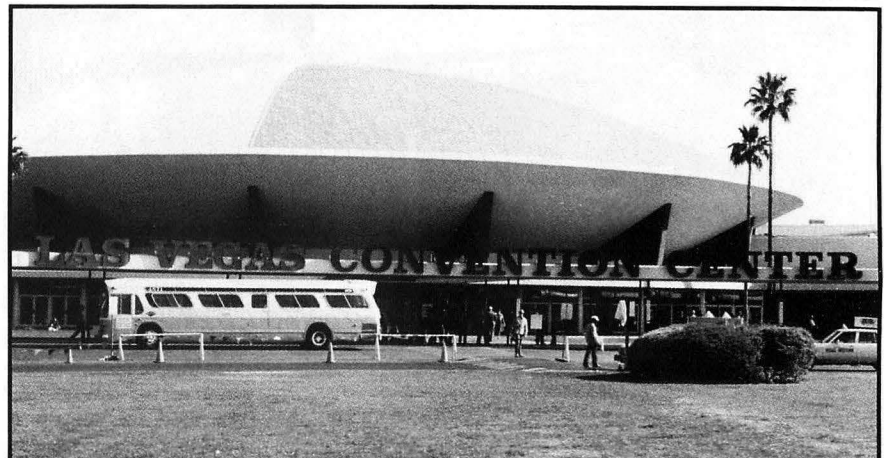


## THE DATABASE MACHINE BY COGENT

COGENT, a Bellevue, Washington firm, has announced an IBM PC board it calls The Database Machine. At first it seems a little overstated to call a board a machine, but in this case it is legitimate. The DM (for short) is a true back-end processor for the IBM PC that is engineered to replace the XT disk controller. It contains a ROM operating system and an on-board 80186 that runs independently from the host. The DM performs all file

access functions and will allow shared files by implementing a record locking scheme. Cogent claims that certain file operations operate six times faster than with the IBM adapter. The DB is compatible with all the standard PC operating systems and contains 192K of on-board ram. The DB used in conjunction with a local area net can act as a file server, and provide for multiuser, distributed database service. You need one DB for each hard disk on the network. Cogent's phone number is 206-455-3343.

Circle No. 73



## EXPANDO-VISION

The copy on the front of their glossy flyer reads "EXPANDO-VISION BRINGS POSITIVE SUBLIMINAL MESSAGES TO YOUR TV SCREEN. LET YOUR SUBCONSCIOUS USE THEM TO HELP YOU FORM NEW, CONSTRUCTIVE HABITS... BUILD YOUR CONFIDENCE... ENRICH YOUR LIFE". Stimutech Inc., definitely leads the parade for bizarre computer products with Expando-Vision. The system consists of an interface for your Commodore or Atari computer and a program cartridge which looks about like a video game cartridge. Messages are flashed on your TV screen while you are watching your favorite program. The messages are flashed for just 1/30 of a second which is below one's "level of consciousness", but the subconscious picks it up and starts to influence your behavior. The FCC prohibits broadcasting subliminal messages so there must be something to it. So far, the program cartridges being offered are: Weight Control, Control Smoking, Stress



Control, Control Drinking, Athletic Confidence, Study Habits, Career Success and Sexual Confidence. Somehow this whole thing seems like cheating at solitaire. I must admit it conjures up some odd mental images of the family sitting around watching TV. While I'm trying to cope with my overweight problem my 68 pound, 10 year old

son is getting blasted with "don't eat - don't eat, etc". Or what about the effect on my 13 year old daughter while I'm building my Sexual Confidence. Without wishing Stimutech any bad luck, somehow I'm dubious. Stimutech can be found in East Lansing, Michigan, 800-821-2424. Circle No. 22



## TELEVIDEO ANNOUNCES 16-BIT PORTABLE

Televideo announced its second entry into the portable computer market with its TPC-II. The TPC-II is designed for the business and professional market where they feel portability has an advantage over desk-top systems. It is IBM PC compatible and compatible with the new Tele-XT, Televideo's answer to the IBM XT. The TPC is available with one or two floppy drives with 360KB capacity. It also includes rear panel connectors for a color monitor and composite video. The 8088 processor has 128KB RAM memory and is expandable to 256KB. The 9-inch display includes standard graphics capability of 640 X 200 pixels. The keyboard is the standard IBM configuration and there are built-in serial and parallel interfaces. Televideo is located in Sunnyvale, California, phone 408-745-7760. Circle No. 24

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### THE APRICOT FROM GREAT BRITAIN

The Apricot is being introduced as a "fourth generation microcomputer" and is a very attractively packaged computer with quite a few features. The manufacturer states that sales in Great Britain exceed both the IBM PC and Apple. It is being introduced in the United States by the ACT Corporation located in Santa Clara, California. The Apricot is based on the 8086 and comes standard with 256K of main memory and two 3.5-inch Sony MicroDrives, each with 315 Kbytes of storage. There is an 80-character LCD display built into the keyboard which displays two 40-character lines that allow the computer to operate without its CRT monitor. CP/M-86, Concurrent CP/M and MS-DOS are included along with an integral calculator and bundled executive software. The Apricot is "ready to work" -- when turned on, it comes up with a menu of options and applications. When an application is selected there are prompts on how to run them. The software



includes: MBASIC, SuperCalc, Personal Basic, SuperPlanner, and a communications package with a transfer utility. The LCD display on the keyboard is cleverly placed over the function keys such that they can be dynamically redefined (an exceptional feature) and all keys are soft so the prompting of applications is very powerful. The screen is a

nine-inch, high-resolution CRT with 800 X 400 graphics capability. There are eight fixed-function keys with operations common to all applications, such as help, undo and repeat. The twin disk system with monitor lists in the U.S. for \$3190. For further information contact ACT Inc., at 408-727-8090 in Santa Clara.

Circle No. 25



### THE CHAMELEON

The Chameleon is yet another fine looking portable computer. It is the product of Seequa Computer Corporation of Odenton, Maryland. It has both an 8088 and Z80 processor and supports CP/M 80 and MS DOS. The dual disk drives are formatted at 160KB each, single-sided or 320KB each if double-sided. Memory is 128KB RAM expandable to 256KB. The display is a 9-inch green phosphor CRT formatted at 80 X 25 characters or 40 X 25 characters. External color graphics are supported with a 320 X 200 resolution with four colors from an eight color menu. There is one serial and one parallel port and a built-in fan. Software includes Microsoft BASIC, PerfectWriter and PerfectCalc. Seequa Computer Corporation's telephone number in Odenton, Maryland, is 301-672-3600.

Circle No. 26

### DATA 20 INTRODUCES CP/M SOFTWARE FOR COMMODORE

Data 20 Corporation has recently introduced a CP/M Starter Kit for use with the Commodore 64. The Starter Kit is free, if you purchase Data 20's Z-80 Video Pak which includes CP/M. Newword is a wordprocessor with a full-screen editor and all the standard commands like delete character, delete word, move text, etc., plus global commands, file and mail merge and many other powerful capabilities. Filebase is a database manager that is compatible with Newword. It is menu driven and appears that it would be very useful in the Commodore environment. Data 20 has new competition in that Commodore itself is offering a CP/M module for the "64", the Starter Kit should give Data 20 a boost in this battle. CP/M for the Commodore makes a lot of sense -- now somebody needs to do something about those slow Commodore disk drives. Data 20 is located in Laguna Hills, California, phone 714-770-2366.

Circle No. 27



### MAD-1 WORKSTATION ENHANCED

The MAD-1 is a very stylishly packaged, high-performance computer. Its processor is the Intel 80186 and the company claims twice the performance of the IBM PC while being compatible. It comes with 128KB RAM, a color video controller, 2 RS232 ports, a parallel port and two 360KB floppy drives as standard equipment. The system is priced at \$4195. The enhancements announced at COMDEX were: a built-in 300/1200 212A compatible modem and a half-height 10 megabyte hard disk. The modem option gives the user automatic speed selection and five dialing procedures under software control. The hard disk replaces one of the floppy disks that are standard with the MAD-1. The MAD-1 equipped with hard disk and modem sells for under \$7000. Mad Computer, Inc., is headquartered in Santa Clara, California, phone 408-980-0840.

Circle No. 28





## THE EXECUTIVE 816, A BRIEFCASE COMPUTER

This very compact machine comes to the U.S. from Australia. Made to go anywhere in the world, the power supply will take 110 or 240 volts or will run from a cigarette lighter. The name might imply that it is both an 8- and 16-bit machine, but that is not the case. The processor is a A80A with 64KB memory; there is a 5-inch screen formatted for 80 X 24 characters and the two floppy disk drives have a 1.6MB capacity. There is a connection for an external monitor; a hard disk; dual 8-inch floppy drives. A serial and parallel port are standard. Probably the most notable features about this system are the size, about the size of an attache case, and the software included. The 816 comes with CP/M 2.2, accounting, project costing, membership and mailing, word processing, communications, database, games, time management, spreadsheet software.

Information on where to buy in the U.S. can be obtained by writing to: AMUST Compak, 50 Keys Road, Moorabbin, Victoria 3189, Australia. Circle No. 29

## MENTOR 1000 INTRODUCED BY ADDS

Applied Digital Data Systems Inc., is a wholly owned subsidiary of NCR, one of the largest computer manufacturers. They don't claim PC compatibility - must be big enough to stand on their own. The Mentor 1000 has both 8086 and Z80A processors and will run MS DOS or CP/M. It features high resolution graphics, 640 X 480, in black and white or color. Memory is expandable from 128KB to 768KB and their floppy disks are formatted at 800KB. A 10MB Winchester is available in place on one of the floppy drives. The basic unit has two serial and a parallel port as standard. The Mentor 1000 will be available from ADDS dealers in early 1984 with prices starting at \$3395.

Information on where to find your nearest ADDS dealer can be obtained from their New York office, telephone 516-231-5400. Circle No. 30



### MICROSTANDARD TECHNOLOGIES'S M3000

The M3000 is billed as a transportable computer. It is packaged in an all aluminum, water-resistant, dust-proof case which occupies only one cubic foot. The M3000 comes with three bus options: STD with four slots, VME with two slots or S-100 with two slots. The standard configuration is equipped with either two 376K floppy drives or one floppy and a 10 megabyte Winchester. This system is designed for industrial, scientific and military applications. The base unit is supplied with CP/M Plus. Other processor and operating system options will be offered. Other options include: an internal modem, external 8-inch floppy drives or a streaming tape drive. The price for the basic single floppy drive system is \$1645. MicroStandard Technologies is in New Lebanon, Ohio, call 513-687-1395 Circle No. 56

### TANO MICROCOMPUTER PRODUCTS

TANO displayed two lines of microcomputers: the Apple compatible AVT-2A and The Dragon. The AVT-2A features 64KB RAM, a detachable keyboard with a 10-key pad and 8 function buttons. The bus is compatible with Apple, and has the standard 7 slots for peripheral expansion. The packaging and price are the interesting aspects of this system. Instead of making another "Fruit" machine, the case houses the floppy disk drives and is high enough to hold some very large vertically mounted PC boards. TANO offers a Z80 CP/M personality board and expects to have an 8088 MS DOS board with 256KB on-board RAM in the near future. With Apple, CP/M and MS DOS operating systems on the same machine, the owner of this system should have enough software. Salesmen in the COMDEX Booth were anticipating an internally mounted Winchester in '84.

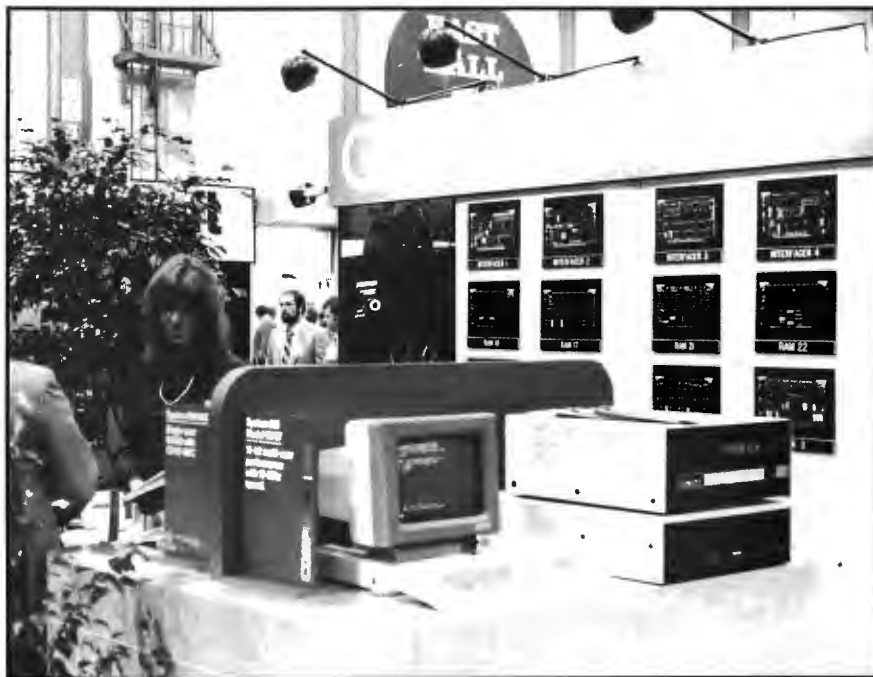
TANO Microcomputer Products is a New Orleans firm, telephone 504-254-3500. Circle No. 60



## COMDEX

### COMPUPRO 10 MAKES DEBUT

The CompuPro 10 is a new multiprocessor system that features concurrent execution of both 8- and 16-bit industry standard software. The price works out to be less than \$1800 per work station. The "10" is aimed at commercial organizations that have been using traditional minicomputers in a multi-user and networked environment. In this system the processors share a portion of common memory and each have dedicated memory. This allows all of the system resources to be available to each user. CompuPro has adopted a master/slave architecture with a central 8088 processor to handle system resources and overhead such as disk, printer, and communications links. In this configuration each terminal has access to its own Z80B processor and dedicated memory for running 8-bit applications. The central 8088 processor and its main memory are dynamically allocated to each user for running 16-bit tasks. Standard features include 768K of main memory, seven serial ports, a Centronics printer port, up to 512K of RAM disk and dual floppy disks storing two Mbytes. In addition



there are four 8-bit Z80B user processors, each with its own 64K RAM. The whole system fits in a compact 7 X 18 X 22 inch cabinet.

The system runs under CompuPro's enhanced MP/M 8-16. In addition it comes bundled with financial spreadsheet, typing tutorial, executive record keeper and word processing application programs, as

well as a sophisticated database management system. Hardware options include: an 8-MHz 8087 math coprocessor, external floppy drives and an internal Winchester drive. Maintenance is through Xerox's new Americare service program. CompuPro is in Hayward, California, phone 415-786-0909

Circle No. 41



# Products and News

## NEC PC-8800 ANNOUNCED

PC-8800 by NEC accepts either 8-or 16-bit software. The system consists of the PC-8801 microcomputer and a wide variety of peripherals. This new computer gives the user 16-bit processing capability, in addition to the standard 8-bit, through use of a convenient add-on circuit board with NEC's own 16-bit microprocessor. The PC-8800 ability to use high resolution graphics in either monochrome or color is built-in. In addition, it includes a detachable keyboard to allow freedom of movement for users, as well as a 14" high resolution monitor which produces larger characters for quick and easy reading. A complete numeric keypad features 5 user programmable function keys--10 available with shift key--and well-placed

editing keys. A responsive N-key rollover input allows speedy, yet accurate, word processing and professional use. For further information about NEC's PC-8800 Microcomputer System, contact Tom Priestley, General Manager, NEC Home Electronics, USA, Inc., 1401 Estes Avenue, Elk Grove Village, IL 60007. Call (312) 228-5900.

Circle No. 32

## DOCUPOWER! ANNOUNCED

Docupower! is a new idea organizer that works with any word processor. Docupower! assembles your random paragraphs, sections, pages, or any other word processor texts into a master indexed resource file of reusable ideas; just pick the sections from the master index to automatically create new word processor texts, reports, letters, proposals, school themes and articles. When you want to create new documents without retyping, scroll through Docupower!'s index. Automatic comment descriptions have been extracted for you from your text. You can view or preview any section before adding to the newly assembled text that Docupower! will create for you. You make up the new text by picking numbers from this indexed idea category file. Docupower! remembers the series of numbers and creates the new text file for you anytime you want to print or edit. Docupower! is published by the creators of Power!, and is available in 20 disk formats for all CP/M, CP/M-86, and IBM-PC computers. Price is \$149. Contact Computing!, 2519 Greenwich, San Francisco, CA 94123. (415) 567-1634.

Circle No. 33







### PC ACCOUNTING PACK INTRODUCED

PC Accounting Pack, Digital Research Corporation's first application package bundle, includes Micro Business Applications' General Ledger with financial report generator, Accounts Receivable with invoicing, Accounts Payable with check writing and Concurrent CP/M 86. These features allow the user to

perform several accounting tasks simultaneously; the programs automatically request access to the computer's printer and release the printer when finished. Available now for the IBM PC and IBM PC/XT, the PC Accounting Pack retails for \$995.00. Individual products are priced at \$2135. Contact Digital Research at 160 Central Avenue, Pacific Grove, CA, 93950.

Circle No. 34

### DATAMAC COMPUTER SYSTEMS ANNOUNCES COMPATIBILITY OF THEIR WINCHESTER HARD DISK SYSTEM WITH THE COMPAQ PORTABLE COMPUTER

Datamac carries a full line of IBM Personal Computer Peripheral Products which can now support the COMPAQ. The Datamac Hard Disk should be considered a home base (non-portable) master media which can be connected to the COMPAQ with a single connection. This feature allows the user's unit to remain portable; he can later download work to the Datamac hard disk. The Datamac Hard Disk System offers storage capacities of 6, 12, 18, 27 and 46 megabytes per drive. The retail price ranges from \$1895 to \$4991. Dealer inquiries are welcome. Datamac Computer Systems, 595 Pastoria Avenue, Sunnyvale, CA 94086, phone (408) 735-0323.

Circle No. 43

### BRANVID SOFTWARE ANNOUNCED

BRANVID software for video rental stores has been announced by John D. Owens Associates, Inc. BRANVID provides video rental stores with a charge-out, check-in system with the option of printed receipts. It lists movie titles by categories. Member files give status of account, expiration, video format and number of films checked out. Management reports feature QWIK-STATS which summarize such daily activity as number of charge-outs and check-ins, number of new titles and new members. BRANVID is menu-driven, and runs under Ashton-Tate dBASE II or dBASE II run-time module. It retails at \$700. For further information, contact John D. Owens Associates, Inc., 12 Schubert Street, Staten Island, New York, 10305, phone (212) 448-6298.

Circle No. 37

### AMT OFFICE PRINTER ANNOUNCED

The AMT office printer from Advanced Matrix Technology, Inc., is a new state-of-the-art desk top dot matrix printer designed to eliminate the need to purchase separate hard copy output devices for the word processing, spreadsheet, graphics, general accounting and overhead transparency output generated in the modern automated office.

The new product offers business users the print quality and flexible paper handling capabilities of a daisywheel printer with the speed, multiple font support and reliable performance characteristics of a dot matrix device. To support word processing, "letter mode" is selected and true letter quality output is printed at 45 characters per second. With the optional multicolor ribbon cartridge installed, business documents such as spreadsheets can be illustrated with high resolution color graphic images with dot addressability of up to 240 vertical by 720 horizontal dots per inch.

The AMT Office Printer also produces overhead transparencies. Using an Orator font optimized for projection, and a multicolor ribbon, text, charts and other images can be produced in a full range of colors. AMT's corporate headquarters and manufacturing facilities are located at 1157 Tourmaline Drive, Newbury Park, CA 91320. Evaluation units of the new Office Printer are available immediately, with quantity shipments scheduled to begin January 1984. Circle No. 35

### NEW LIBRARY EASES THE MIGRATION OF PROGRAMS

Whitesmiths, Ltd., announces the immediate availability of Release 2.2 of its C and Pascal Compilers. The new library eases the migration of programs written under UNIX to the nearly three dozen operating systems now supported by Whitesmiths compilers. These include all of the popular operating system dialects on the PDP-11 family, 8080 and Z80, MC68000, VAX family, and 8086, including the 8088, used in the IBM PC and DEC Rainbow 100, and features optional

support for the 8087 math coprocessor and the enhanced 80186 and 80286 instruction sets. On the IBM PC, programs can run under CP/M-86, DOS 1.X, or under DOS 2.0. The compiler packages include the C Native Compiler, the Pascal Translator (if applicable), libraries, media, and documentation. Other programming utilities are included. A C Native Compiler costs \$550; Pascal Native is \$1100; a C Cross Compiler is \$1100, and Pascal Cross is \$1400. For further information, call (617) 369-8499, Cristina Hanley, Whitesmiths, Ltd., 97 Lowell Road, Concord, MA 011742. Circle No. 38

### VIRTUAL MICROSYSTEMS RELEASES BRIDGE/86

Virtual Microsystems has released BRIDGE/86, a DEC VAX-based microcomputer software development system for MS-DOS and CP/M-86 microcomputers. BRIDGE/86 is an extension of

VMI's family of BRIDGE products, which allow minicomputer programs to run microcomputer software. BRIDGE/86 includes the BRIDGE software, a license to MS-DOS or CP/M-86, VMI's 88-Board, and a variety of software development utilities. In BRIDGE/86, MS-DOS or CP/M-86, code runs on the 88-Board, which features 2 8088 processors, 512 Kbytes of memory, serial ports, and a bit-slice controller. The BRIDGE software runs on the VAX, and maps all MS-DOS or CP/M-86 output onto the VAX peripherals. All code written is stored in VAX files, so that the VAX automatically imposes a level of source code control and permits multiple programmers to work together on the same project. Cost for the BRIDGE/86 system is \$7500. Additional 88-Boards can be added to a system for \$4000 apiece. Quantity discounts are also available. Call VMI at (415) 841-9594 for additional information. Ask for Deryk Van Brunt. Circle No. 45

### INFO-80 APPLICATION DEVELOPMENT SYSTEM ANNOUNCED

INFO-80 Application Development System is a complete data base system targeted for the beginner as well as the advanced computer user. INFO-80 includes building blocks for file definition, data entry and editing, file sorting and merging, record access selection, report and letter writing, file format conversion and menu driven job control. It will interface with word processors, and allows INFO-80 files to be merged with text for correspondence processing. Custom programs written in any CP/M based language can be easily interfaced. INFO-80 uses an 8080, 8085, Z80 based computer with 64K bytes of memory, at least 500K bytes of disk storage and a computer that uses the CP/M operating system. Price: \$395. Contact the Software Store, 706 Chippewa Square, Marquette, MI 49855. (906) 228-7622. Circle No. 46

## EUREKA!™



### "Up the creek" Searching for files?

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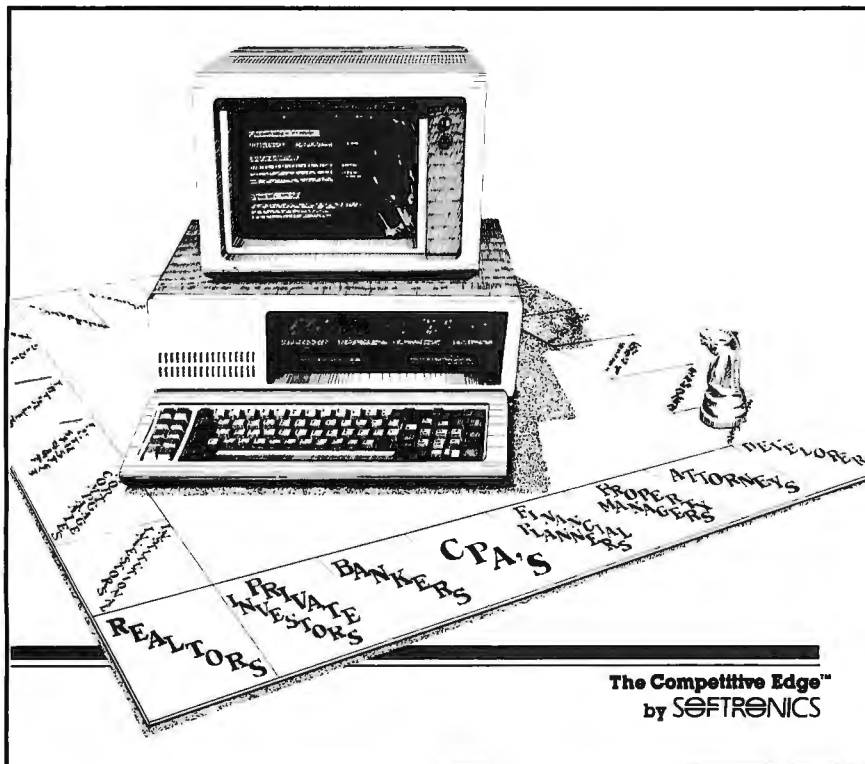
CP/M is a trademark of DIGITAL RESEARCH. LYNC is a trademark of MIDNIGHT SOFTWARE.

Circle No. 36

JANUARY/FEBRUARY 1984

CP/M REVIEW

65



## SOFTRONICS ANNOUNCES THE COMPETITIVE EDGE

The Competitive Edge, available from Softronics, Inc., was developed to assist realtors, brokers, bankers, accountants, developers and private investors. The program can quickly analyze complex purchase offers and determine the best terms from the seller's point of view. No software or programming knowledge is needed to run it. The Competitive Edge is compatible with CP/M based microcomputers and is available in both 5 1/4" and 8" disk formats. It is also available for the IBM-PC and IBM-PC compatible computers. Retail price for the Competitive Edge is \$500. A \$10 demonstration kit is available for experimenting with the program prior to purchasing it. For further information, contact Ken Zaremba, Softronics, Inc., 100 S. King Street, Suite 270, Seattle, WA, 98104, phone (206) 587-0688. Circle No. 49

# PROGRAMMERS-

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We research and specialize only in software for programmers of micros. If a product is unknown to you and we recommend it, then we take the risk.

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### "C" LANGUAGE

	LIST PRICE	OUR PRICE
APPLE: AZTEC C-Full, ASM	\$199	call
8080: BDS C-Fast, popular	150	125
8080: AZTEC C-Full	199	call
Z80: ECOSOFTE-Fast, Full	250	225
8086: C86-optimizer, Meg	399	call
8086: Lattice-New1.1 & 2.0	600	495
MicroSoft (Lattice)	MSDOS 500	call
Digital Research - Megabyte	8086 350	280
Desmet by C-Ware-Fast	8086 109	99

### BASIC

	ENVIRONMENT	LIST PRICE	OUR PRICE
Active Trace-debug	8080/86	\$ 80	73
MBASIC-80 - MicroSoft	8080	375	\$255
BASCOM-86 - MicroSoft	8086	395	279
CB-86 - DRI	CPM86/PC	600	449
PBASIC - DRI	8086	150	119
Business BASIC-MicroS	MSDOS	600	449

### EDITORS Programming

	ENVIRONMENT	LIST PRICE	OUR PRICE
BELLSOFT - PASCAL	MSDOS	\$ 245	call
C Screen Editor - source	8080/86	NA	60
EDIX	PCDOS	195	149
FINAL WORD	8080/86	300	225
MINCE	CPM, MSDOS	175	149
PMATE - powerful	CPM	195	175
	8086	225	195
VEDIT - full, linked	CPM, PCDOS	150	119
	8086	200	159

### SERVICES

- \* Programmer's Referral List
- \* Compare Products
- \* Help find a Publisher
- \* Evaluation Literature
- \* Dealer's Inquire
- \* Newsletter
- \* Rush Orders
- \* Bulletin Board

### PASCAL

	ENVIRONMENT	LIST PRICE	OUR PRICE
PASCAL MT+86	CPM86	\$400	\$295
without SPP	CPM80	350	259
MS PASCAL 86 -	MSDOS	350	280
ALCOR PASCAL full w/	8080	250	call
right extensions to learn			
SBB PASCAL - great, fast	PCDOS	350	315
PASCAL 64 - nearly full	COM 64	99	89
UCSD PASCAL Compiler	UCSD-PC	375	call

### LANGUAGE LIBRARIES

	ENVIRONMENT	LIST PRICE	OUR PRICE
C-to-dBASE - interface	8086/86	NA	\$95
C TOOLS - Graph. Str.	PCDOS	NA	115
FLOAT87 - Lattice. PLI	PCDOS	NA	115
GRAPH GSX-80	CPM80	60	50
HALO	PCDOS	150	125
ISAM Access Manager-86	8086	400	300
PHACT - with C	PCDOS	NA	250
FABS	CPM80	150	135
PASCAL TOOLS	PCDOS	NA	115
SCREEN Display Mgr-86	8086	500	375
PANEL-86 - many	PCDOS	NA	315
WINDOWS - AMBER	PCDOS	295	call

### FORTRAN

	ENVIRONMENT	LIST PRICE	OUR PRICE
MS FORTRAN-86 - Megabyte	MSDOS	\$350	\$265
SS FORTRAN-86	CPM-86	425	345
FORTRAN-80 - '66 decent	CPM80	500	350
INTEL FORTRAN-86	IBM PC	NA	1400

### ASSEMBLER

	ENVIRONMENT	LIST PRICE	OUR PRICE
MAC/65 - macros, fast	ATARI	\$80	\$75
MACRO-80 -	CPM80	200	149
ORCA/M - Reloc., Macro	APPLE	149	129
RMAC, etc. (Prog. Util)	CPM80	200	159
RASM	8086	200	159

### OPERATING SYSTEMS

	ENVIRONMENT	LIST PRICE	OUR PRICE
CPM-86	PC	\$60	\$49
"CPM86 Emulator"	MSDOS	NA	95
MicroShell upgrade CPM	8080	150	125
"MSDOS Emulator"	CPM86	NA	95
"Multitasking PCDOS"	PCDOS	239	179
QNX - real time UNIX	PC	650	call

### TOOLKITS

	ENVIRONMENT	LIST PRICE	OUR PRICE
C Helper - DIFF, Flow	8080/86	NA	115
MicroTools	CPM80	150	125
NORTON for 11 or 20	PCDOS	80	65
NORTON Book with Disk	PCDOS	80	65
Power	CPM80/PC	169	139
Programmer's Toolkit	8080/86	NA	95

### COBOL

	ENVIRONMENT	LIST PRICE	OUR PRICE
CIS COBOL - no royalty	CPM80/86	\$800	\$600
Level II COBOL - High	8086	1600	call
MS COBOL-86	MSDOS	750	595
RM/COBOL-80	CPM80	750	595
RM/COBOL-86	8086	950	745

### LOOKING FOR

- \*Fortran Level H with no changes for PCDOS
- \*COMMERCIAL TOOLS - COMM 64

### OTHER PRODUCTS

	ENVIRONMENT	LIST PRICE	OUR PRICE
ADA - Janus	CPM-80	\$300	\$259
ADA - Janus with tools	PCDOS	500	449
LISP - IQ LISP - full,	PCDOS	175	call
MAGIC/L - Intriguing	CPM80	295	call
MODULA II -	8086	495	455
MODULA II - PCCode	APPLE	495	455
PL/1-86 - DRI	CPM-86	750	560
PL/1-80 - DRI	8080	500	369
ASCOM 80	CPM80	175	159
CACHE/Q - Virtual Mem.	CPM80/PC	225	185
MITE/BYE	8086/86	200	179
"Read CPM86"	MSDOS	NA	95
LYNX - Overlay Linker	CPM80	250	215
PLINK-86 - Overlay, Meg	MSDOS	350	315
MSDOS Debugger	NA	135	
Trace-86		.25	.115

### RECENT DISCOVERIES HIGHLIGHTED

C Helper includes source in C for CP/M80, MSDOS for a: DIFF, GREP Flowcharter, XREF, C Beautifier and others. \$115.

Note: all prices subject to change without notice.

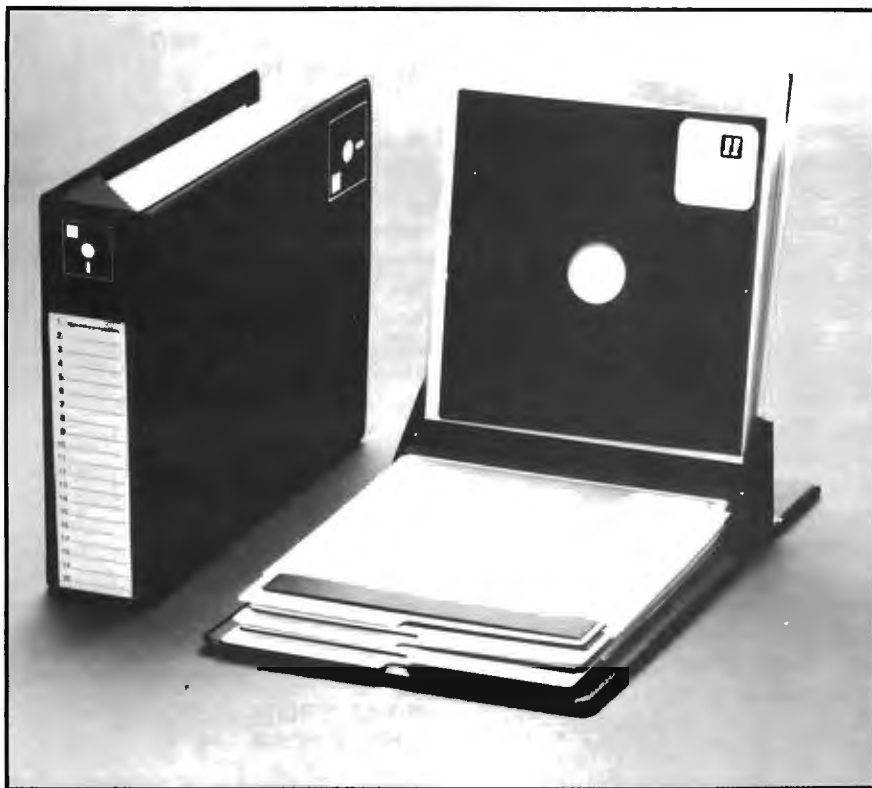
Call for a catalog, literature, comparisons, prices. Shipping \$2.50 per item purchased. All FORMATS available.

### THE PROGRAMMER'S SHOP™

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Circle No. 47



#### **RING KING VISIBLES, INC., INTRODUCES ITS DISKETTE FLIP FILE**

This vinyl binder holds 20 full size or mini diskettes within individual protective sleeves, and comes complete with removable index

strips in 4 colors and a printed diskette reference on spine. For further information contact Ring King Visibles, Inc., 2210 Second Avenue, Muscatine, IA 52761; phone (319) 263-8144. Circle No. 50

#### **PLASTIC PRINTWHEELS NOW AVAILABLE**

Plastic Printwheels with glass reinforced characters are now available for Diablo, Qume and C Itoh daisywheel printers using 96-character plastic printwheels. These printwheels offer a longer life than conventional plastic printwheels and produce a better print quality. A printout of the 14 typestyles is available from: Business Support Services, Inc., 705 Butternut Avenue, Royal Oak, Michigan 48073.

Circle No. 51

#### **TRI-DATA AWARDS CONTRACTS**

TRI-DATA has awarded contracts to QYTEL, Ridgefield, N.J., Networks, Inc., Miami Lakes, Florida; CGDATACOMM, Pittsburgh, Pa.; and Sunbelt Data Services, Inc., Houston, Texas, as systems distributors for its

NETWAY family of communications processors. Tri-Data's NETWAY product family allows a variety of hosts, personal computers, terminals, word processors and peripheral devices to communicate in a network regardless of protocols used. The processor can be configured as a multiplexor, protocol converter, cluster controller, packet processor and nodal processor. Among the protocols supported by the NETWAY product family are IBM BSC and SNA/SDLC as well as Burroughs Poll-Select, ASCII Start/Stop, ICL C03 and X.25. Tri-Data is a manufacturer and supplier of communications products. Its OZ message-station and intelligent network modem products have been approved and used by many major carriers in the U.S. and Canada. Tri-Data is located at 505 East Middlefield Road, Mountain View, CA, 94043. (415) 969-3700.

Circle No. 52

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Circle No. 53

#### **GRAFTALK TO RUN ON THE DEC RAINBOW 100**

GRAFTALK, a business graphics software package by the Redding Group, has been specially adapted to run on Digital Equipment Corporation's Rainbow 100. Graftalk is a device-independent, business graphics software package that uses English language commands interactively, runs commands from disk files, or uses customized or standard menus. It produces stacked, percentage, clustered or floating bars; exploded pies; scatter diagrams; line and combination plots; and a range of move, draw and other graphics and text commands. It also includes a mini-spreadsheet and text editor. Other systems recently supported include the IBM-PC and Zenith; NEC, Epson, and Victor are among those in the works. Contact the Redding Group, 609 Main Street, Ridgefield, CT 06877; (203) 431-4661.

Circle No. 54



### NEW \$99 DISK DRIVE TEST KIT for KAYPRO 2†

Test yourself and save money

At last, an easy to use drive test kit for owners of Kaypro 2. Don't wait until you get "DOS ERROR". Our \$99 kit will save you time and let you use your Kaypro 2 confidently!

Now you can know exactly how good or bad your disk drives are doing. This is imperative when you wish to exchange data with other Kaypro 2 users. In less time than it takes to make an omelette you can perform these four important tests on any Kaypro 2:

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Order now and receive our TEST program disk and a special DDD (Digital Diagnostic Disk).†† You also get a thick service manual for your disk drives and our own easy to read Drive Diagnostic Users Guide. We even put in photos and gadgets to help you adjust or repair either disk drive yourself.

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Circle

No. 31

† Available only for Kaypro 2, not for Osborne 1.  
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### NEW DEVELOPERS OF EDUCATIONAL SOFTWARE ADDED

Soft-Kat, Inc., has added four new developers of educational soft-

ware--Developmental Learning Materials (DLM), Micro-Ed, Program Design, Inc. (PDI), and Learning Well--to its catalog of math and language programs for elementary school levels. The new lines are designed to run on Apple, Atari, IBM, and Commodore computer systems. Micro-Ed adds math, spelling, economic, and other academic programs especially for the Commodore Computer. PDI has developed the New Step By Step and Step By Step Two programs which are designed to teach BASIC programming to students from 6th grade through adult. Learning Well programs are designed to run on Apple and Atari personal computers. For more information on these or other lines distributed by Soft-Kat, contact Modie Katz, Soft-Kat, Inc., 15015 Oxnard Street, Van Nuys, CA, 91411. The telephone is (213) 781-5180.

Circle No. 55

### P-SPOOL UTILITY PROGRAM ANNOUNCED

P-SPOOL, produced by Elite Software, is a utility program for CP/M based computers that will print the contents of a file at the same time some other program is running. Unlike other print "spoolers" P-SPOOL does not hinder keyboard input or screen functions. P-SPOOL provides transparent use because it allows the user to set a "priority level" for printing data that allows smooth keyboard operation and maximum printed output. Price: \$99. A version of P-SPOOL for use on computers that use the MSDOS operating system, including the IBM PC, will be available in the first quarter of 1984.

Circle No. 57

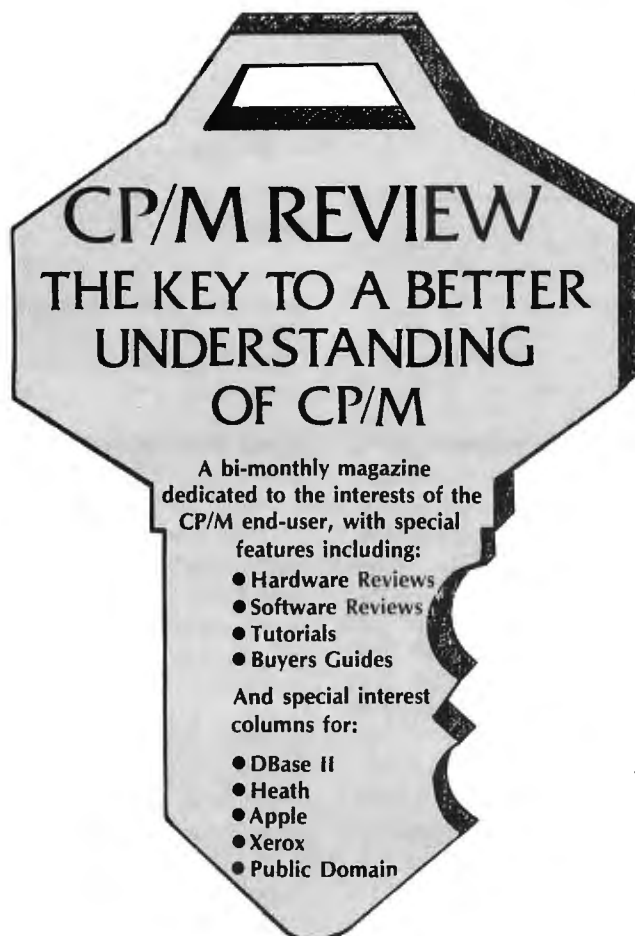
### P-FILE UTILITY PROGRAM ANNOUNCED

P-FILE is a utility program for CP/M based computers that allows you to route the printer output from any program to a disk file. With P-File, applications programs that usually only print reports to your printer can now print reports directly to disk. There are no minimum memory or disk drive requirements. The cost is \$129. A version of P-File for use on the IBM-PC and other computers that use the MSDOS operating system will be available in the first quarter of 1984. Contact Elite Software, P.O. Drawer 1194 Bryan, TX 77806. Circle No. 58

### NEW DYNACOMP CATALOG AVAILABLE

DYNACOMP announces the first printing of its Fall, 1983 catalog; it is more than twice the size of the 1982 catalog, and contains three times as many items. The first printing is being sent to those currently on DYNACOMP's mailing list. The second printing will be available to anyone who requests a catalog either by phone or by mail. DYNACOMP catalogs are sent free to addresses within the U.S. and its possessions. There is a \$2.00 charge for shipment outside this region. Contact DYNACOMP, INC., 1427 Monroe Avenue, Rochester, NY 14618. (716) 442-8960.

Circle No. 59





## PHYSICIAN MICRO SYSTEMS ANNOUNCES MEDI-DICT

MEDI-DICT (TM), the first full-featured word processing package for the medical office, has been introduced by Physician Micro Systems. Running in conjunction with WordStar, MEDI-DICT can save time for both the dictating physician and the transcriptionist. MEDI-DICT eliminates the need to dictate or type the repetitive elements in medical records; it features automatic patient reminders, and the storage and analysis of patient data. MEDI-DICT is designed for people with little or no microcomputer experience, and uses menus and a simple question and answer format. Technical requirements are:

- Z-80 based microcomputer with 58K of RAM.

- 2 disk drives with at least 180K of storage per drive; 300K is preferable.

- CP/M operating system, version 2.0 or later.

WordStar word processing program with the MailMerge option.

A version for the non Z-80 CP/M based computer is available on request for an additional charge. The price of the package is \$795. Contact Physician Micro Systems, Inc., 801 East Harrison Street, Suite 105, Seattle, WA 98102. Phone (206) 527-4010. Circle No. 62

## PAYROLL PAC INTRODUCED

Payroll Pac, the first module in a complete series of financial packages produced by DBi Software Products, works in all 50 states, and will handle payroll requirements for up to 500 employees. Payroll Pac is available through microcomputer dealers, or write Marketing Division, DATA Basic, Inc., 102 So. Main St., Mt. Pleasant, Michigan, 48858.

Circle No. 64

## EVALUATION KIT ANNOUNCED

SGS Semiconductor Systems Division has developed a Z8003 evaluation module with virtual memory capability on a MULTI-BUS format. The SAM-Z8003EVM is a ready-to-use evaluation kit and when connected to a terminal or host computer provides a quick and inexpensive way to evaluate the latest 16-bit microprocessor technology. The evaluation module uses integrated circuits such as the Z8003 CPU virtual memory processor unit (VMPU) and the Z81015 paged memory management unit (PMMU). The resident monitor program and control unit permit the control, inspection, and alteration of on-board and off-board resources, including memory, input/output ports, VMPU and PMMU registers, breakpoint set and clear, run and single-step program execution, and time and date. Complete compatibility with the industry-standard IEEE 796 specification MULTI-BUS (P1), and SGS' SAM-BUS

(P2), allows direct interface with other SGS advanced modules (SAM) and with a variety of other boards that are available on the market. SGS USA is located at 1000 East Bell Road, Phoenix, Arizona, 85022. (602) 867-6100. Circle No. 65

## ATI TO SELL TRAINING SOFTWARE FOR THE IBM PC

American Training International (ATI) has signed a contract with IBM Corporation to sell ATI's line of interactive computer training software for the IBM Personal Computer. IBM will market the training package through IBM Product Centers, its National Accounts Division and its National Marketing Division. ATI products to be sold by IBM include training software for WordStar, VisiCalc, MBASIC, and PC DOS for the IBM PC. Call ATI, 3770 Highland Avenue, Suite 201, Manhattan Beach, CA, 90266, (213) 546-4725.

Circle No. 66

## Introducing SPL the first multi-mode spooler for CP/M computers

If you believed that your computer couldn't do better than a single task system think again. You can convert your machine into a dual-task computer with SPL, the amazing Spooler program developed by Blat R+D. SPL enables you to use hidden capacity available on your CP/M computer to print documents and run your ordinary programs, all at once.

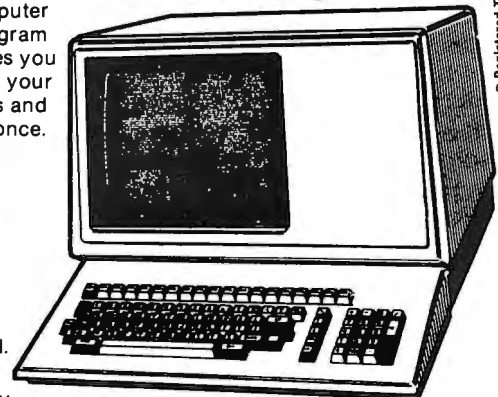
While printing, your regular programs won't stop processing, waiting for the printer to finish. SPL will store the information to be printed in internal or external (disk drives) memory until the printer is ready to receive the data. Result: your programs will run at full speed.

As SPL can use up to the full capacity of your disks for temporary storage, it's much more powerful than hardware spoolers, which are limited to 64k memory or less.

SPL is an advanced product with several modes of operation. In addition to intercepting the output to the printer, SPL can print your existing text files, or those that your programs will create from now on. SPL will even take care of tab expansion. As an added bonus, SPL needs no installation on most CP/M 2.x computers.

Circle No. 69

## If you have a computer Get A Second Computer FOR \$139



You could get an equivalent increase in computing power by spending \$1000 to \$3000, but SPL is only \$139, including disk and manual.

To order your SPL program call us today specifying what disk format you require. You can charge it to your VISA or Master Card if you prefer.

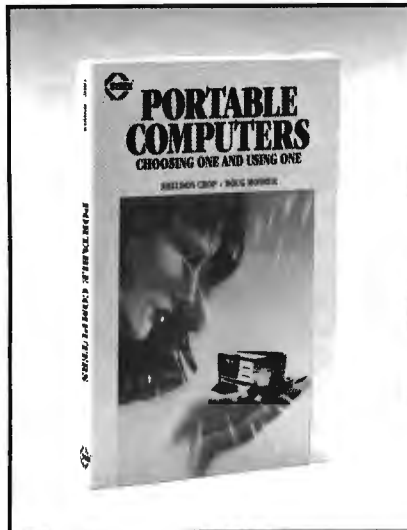
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### SYBEX INTRODUCES TWO COMPUTER BUYING GUIDE BOOKS

SYBEX, publishers of computer books, has launched the SYBEX POPULAR SERIES with its first two computer buying guide books, *FAMILY COMPUTERS UNDER \$200* and *PORTABLE COMPUTERS*, published this October. *FAMILY COMPUTERS UNDER \$200* by Doug Mosher (\$3.95) is written for the person with no previous computer experience, and



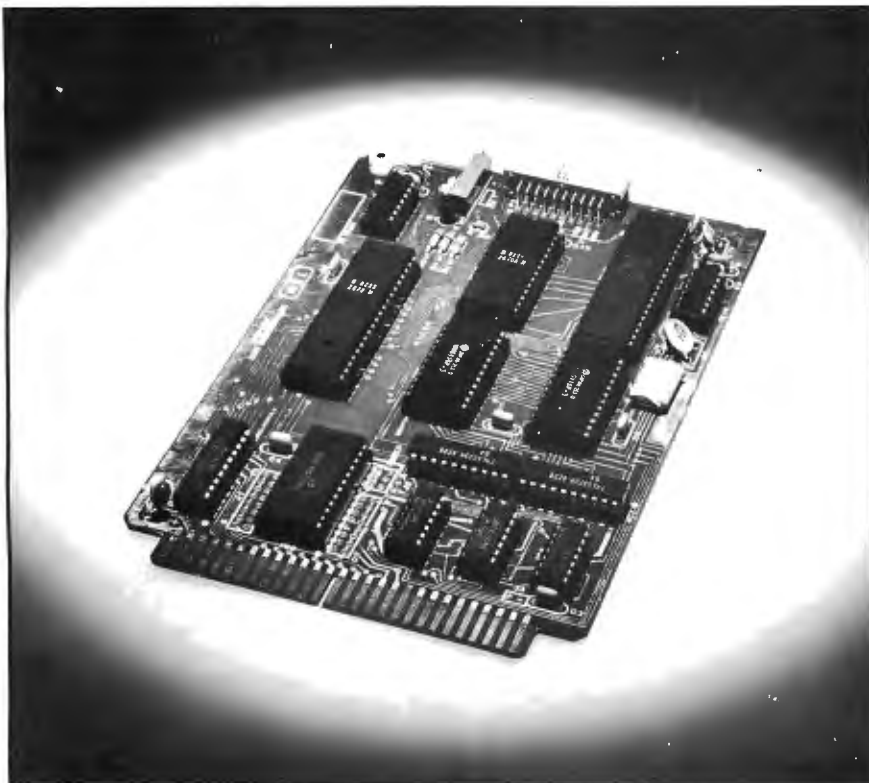
shows buyers how to evaluate their needs when choosing a computer for the home, as well as what they can do with the computer once they get it there. *PORTABLE COMPUTERS*, by Sheldon Crop and Doug Mosher (\$7.95), explains the differences between the popular portables, and what to know before shopping for one. It shows how four people use portables in their daily lives. For further information, contact SYBEX, 2344 Sixth Street, Berkeley, CA., 94710, phone (415) 848-8233. Circle No. 74

### WORDCRAFT ANNOUNCES FILE TRANSFERRING SYSTEM

Wordcraft has released a standard protocol for transferring files between mainframe and microcomputers. "The Christensen File Transfer Protocol" contains a block-structured algorithm and implementation notes to aid mainframe programming in COBOL, Fortran, and other languages. The protocol, already built into Wordcraft's personal computer communications program, The Micro Link II, is used widely in micro-to-micro file transfers with automatic error correction. The Christensen protocol transfers text, data, spreadsheets, object code, and any other file defined as a sequence of bytes. Used with data exchange formats like SDF or DIF, the protocol can download subsets of corporate data into personal computer spreadsheets and databases. The specification and all rights to implement the protocol at a single host installation are available for \$395 from Wordcraft, 3827 Penniman Avenue, Oakland, CA 94619. (415) 534-2212. Circle No. 70

### MICRO-LINK ANNOUNCES NEW CRT CONTROLLER CARD

MICRO-LINK's new CRT Controller Card, the STD-156, is designed to provide extensive attribute capabilities for an STD Bus based system. Display format, video timing and cursor are fully programmable and provide the user with a variety of display options, including split screens, horizontal scroll capabilities and extensive attributes such as character blink, character blank, underline, dual intensity, highlight and reverse video. Major components of the card are a programmable video timing controller, 2K of character RAM, 2K of attribute RAM, display character and graphics generator, and video attributes controller. The card is I/O mapped and only uses 10 address locations. For more information, contact Chester Kopinski, Micro-Link Corporation, 14602 North U.S. Highway 31, Carmel, Indiana 46032. Call 800-428-6155 or (317) 846-1721. Circle No. 71



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CP/M to IBM and IBM to CP/M. The CP/M - IBM version of REFORMATTER conversion software reads and writes IBM 3740 formatted diskettes and gives CP/M users the ability to exchange data on floppy diskette with IBM equipment and any equipment accepting the IBM 3740 diskette. Microtech Exports Inc., 467 Hamilton Avenue, Suite 2A, Palo Alto, CA 94301. (415) 324-9114.

**MP/M 8 - 16 SYSTEMS.** Multi-user CP/M compatible S-100 systems. Business, utility, and scientific orientation. Call for quote. G & G Engineering, Inc., 1922 Republic Avenue, San Leandro, CA 94577. (415) 895-0798.

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**RM/COBOL** is a high level implementation of the ANSI 74 COBOL standard designed for the development and execution of COBOL business applications on microcomputers. \$750 - \$1250. Ryan-McFarland Corporation, 3233 Valencia Avenue, Aptos, CA 95003. (408) 662-2522.

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### PRACTICAL GUIDE TO CP/M

by Carl Townsend is an encyclopedia of information, tricks, and tutorials regarding the popular operating system, CP/M. This clearly written book contains appendices on CP/M memory map, CP/M diagnostics, software suppliers, and CP/M user groups. \$14.95. dilithium Press, 11000 S.W. 11th Street, Suite E, Beaverton, OR 97005; P.O. Box 606, Beaverton, OR 97075. (800) 547-1842.

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**SCRIBEWITER IX reviewed DDJ 5/81** continues to please many happy users (thank you all) and is now available on Osborne I without source code. Order now at \$150 and get away from the drudgery of you free Wordstar! Copyright © 1983, Microtrain Limited. Franchise holder: Dave Friedman, P. O. Box 5299, Richmond, CA 94805. (415) 222-3806.

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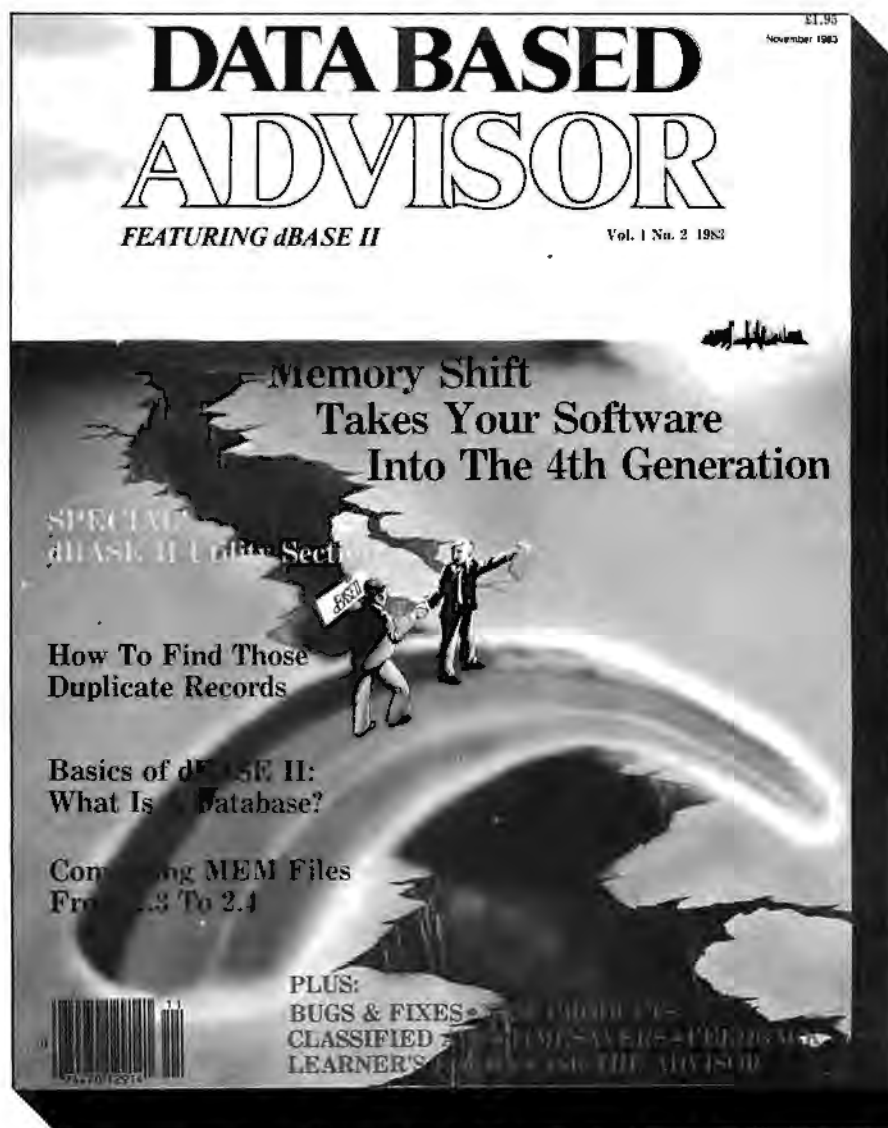
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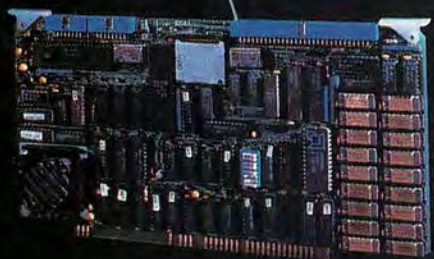
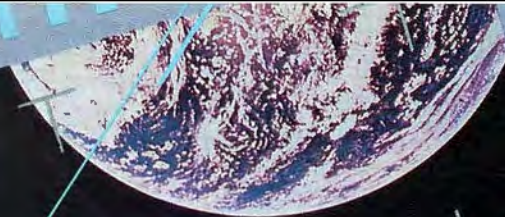
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